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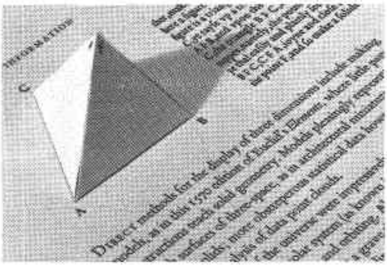

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Technical Services Research, 1988–1991

Charles W. Simpson

The question of what constitutes technical services and thus its body of research remains relevant as traditional organizational and functional boundaries have continued to blur in many libraries. Research in technical services (activities related to the acquisition, processing, preservation, and provision of bibliographic access to materials) published between 1988 and 1991 is reviewed. Rather standard topics continue to be explored, there is little replication, and few studies are supported by grants. Little research is experimental, and there is little collaboration among librarians and library science faculty. However, the body of research continues to be well conceived, well executed, and relevant.

Four years have elapsed since the last review in this journal of research in technical services. That annual survey by Walker and Hudson, which focused on research methodology, followed an annual survey of the previous year by the same authors.[1,2] These surveys were the first of their kind. To be certain, research in technical services had been included in more general articles, but none focused on research materials.

In these intervening four years the question of what constitutes technical services and thus its body of research continues to be explored as traditional organizational and functional barriers have continued to crumble in many libraries. For the purposes of this survey, technical services has been defined as those activities related to the acquisition, processing, preservation, and the provision of bibliographic access to materials. It excludes circulation, collection development, online catalog design, and card catalog and online catalog use (but not content) unless the research reflects directly on cataloging, classification, or related activities. This definition was used even though many technical services librarians are actively engaged in work in some of the excluded categories.

In general, the criteria that applied in the last two surveys apply also to this summary. Works discussed here should include the presentation and analysis of data collected by means of experiments, surveys, field studies, or other means, and should include stated methodologies. In addition, some models have also been included.

The methodology for identifying the works cited was relatively straightforward. After a false start of attempting to identify appropriate journal literature through online database searches, the technique of browsing through relevant journals was employed as the primary means of identifying journal literature. In addition, references found in various sources were

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pursued, and the Research Libraries Information Network (RLIN) database was searched for relevant monographs and other materials. Complete runs from 1988 to 1991 of more than twenty journals were examined including all journal titles represented in the bibliography as well as the *Journal of the American Institute for Conservation*, *Library Trends*, *New Library Scene*, and *Technicalities*; only partial volumes were examined of *Advances in Library Automation and Networking*, *Advances in Library Automation and Technology*, *Advances in Library Information Technology*, and *Advances in Serials Management*. Newsletters were generally not investigated.

Although the intention was to be comprehensive within these bibliographic parameters, any such process is selective. Some decisions were made for inclusion when a marginal work (in terms of the criteria or the research intention of the author) represented an interesting approach or topic. The most selective process occurred in the area of preservation; this procedure is explained below.

ACQUISITIONS

Work in acquisitions included the traditional analyses of approval plans and vendors, a study of U.S. and U.K. imprints, cost studies, and surveys related to automation and preorder searching. A great deal more research in acquisitions occurred than what is cited. This material was excluded because it represents collection management and development issues.

APPROVAL PLANS

Two of these studies infringe on the gray area between acquisitions and collection development but are included for their broader implications for shared cataloging and workflow. Loup's study includes an examination of the approval profiles in philosophy and political science of twenty-eight academic libraries who used the same vendor. The results showed that similar material was received by the libraries, implying that there is substantial duplication of collections due to approval plans. It is cited here because of the shared cataloging implications.

St. Clair and Treadwell compared the performance of four vendors (two general approval vendors and two science and technology specialty vendors) in identifying science and technology titles matching a profile. Only 4% of the titles would have been supplied in the time period by all four vendors, 17% by three, 30% by two, and 49% by one vendor. More titles were supplied by the specialty vendors, although no vendor scored well on supplying materials from noncommercial publishers.

Warzala compared approval plans with standing orders for six monographic series by analyzing all of the titles issued within them for a ten-year period for frequency of publication, price, subject, and intended level of readership. Two of the series titles were in the hard sciences and were judged best suited to acquisition by standing order due to their limited scope, consistent relationship of titles to the series, and consistent level of readership. The remaining four series (three in the social sciences and one general science), however, were sufficiently diverse in subject (and not necessarily always in agreement with the subject of the series title) and readership level to indicate a benefit for acquiring via approval plan.

Research indicates that the substantial duplication of materials in certain disciplines supplied to different libraries by the same vendor is logical, and the variation from different vendors dictates a continued and careful analysis of science and technology approval plans. The fact that some monographic series are more focused than others indicates that these are more suited to standing order, whereas others that are less focused are more suitable for approval plan purchase. These findings would also confirm that classification decisions made for monographic series based on one or two early volumes ultimately may be discovered to have been inappropriate.

AUTOMATION OF ACQUISITIONS

In 1986 Nelson tested the hypothesis that there is a direct correlation between the size of a library and the extent of its automation by analyzing 138 returned questionnaires from small academic libraries. She determined that there is a statistically significant relationship between library automation and student body size, size of the collection, and the monograph acquisitions budget.

Although this hypothesis might be valid for years to come, it would seem that with the growing availability of affordable desktop automation solutions for small libraries, factors other than size might well become evident in the automation of monographic acquisitions for these libraries.

COSTS

Cost studies are scattered throughout this survey according to their focus. Bierman describes a methodology for analyzing the costs of acquiring books at a public library and applies it to a study of the costs of acquiring English and Spanish print materials. The unit cost for staff was $5.63 with a total cost of $11.26 per unit when a prorated portion of the processing unit's general administrative and direct costs for supplies, computer support, etc. were added. Boissonnas (A) describes the steps in defining acquisitions costs using functional cost analysis and presents the data from a 1984 cost study at an academic library. The results indicated a cost of $5.42 to order, receive, and forward to the catalog department one monograph. He compares the methodology to that used by Tantalus, Inc. Phelps (A) describes the methodology and compares the costs of acquisitions over a five-year period, spanning the introduction of an automated acquisitions system at an academic library. Not surprisingly, automated acquisitions proved more costly during these years of implementation. Schmidt's survey of preorder searching includes a methodology for costs analysis based on that of Groot.

The similar cost for acquiring a monograph revealed in two of the studies is remarkable. The long-standing assumption that implementing automation is expensive is confirmed in this research with important implications for managers in technical services.

PREORDER SEARCHING

As preorder searching is a vitally important activity that is in transition in many libraries, research on this activity is welcome.

Schmidt's survey, described as informal, included twelve libraries of various types and examined the preorder search process, including staff resources, staff time expended on the process, and duplication levels. Importantly, six vendors were also surveyed for the type of information required to process orders and the reasons for returned material.

U.K. AND U.S. IMPRINTS

Kruger compared the prices and availability of common titles published in the United Kingdom and United States. A sample of 384 U.K. university press approval books (146 titles) and trade books (238 titles) were selected from 1988 receipts and searched eighteen months after the close of that year in *British Books in Print* and U.S. *Books in Print*. Of the total, 74% had been published in the U.S., of which 90% were available within three months of publication in the U.K. and 99% within one year. U.S. editions cost an average of $5.55 less than their U.K. counterparts, although some U.K. editions cost less. The question of whether to use a U.S. or U.K. vendor to supply common titles is addressed here. U.S. imprints should be available for 74% of these titles within one year of publication in the United Kingdom and should cost less, based on prices in U.S. *Books in Print.* It has been observed by Boissonnas (B), however, that these prices are frequently unreliable.

VENDOR ANALYSIS

In addition to the work cited above by St. Clair and Treadwell on approval plan vendors, the following vendor analyses were conducted.

Brownson proposes a detailed diagnostic vendor performance and comparison model with important implications for budgeting and fiscal management. This model makes reference to that of Cooper, who analyzed 4,700 orders from sixteen vendors over a 300-day period and used product limit estimates and accelerated failure time models to address arrival time variations and to predict claiming intervals. Of the total, 36% of the titles required claiming (some two or three times) with variation among vendors ranging from 15% to 74% of titles. Delivery times varied by vendor from a mean of 82 days to 205 days.

Kflu evaluated a library's four major vendors over two time periods to assess fulfillment, speed of delivery, and discount. Vendors are ranked by means of a numerical formula incorporating weight factors based on aggregate of ranks and value judgment of the researcher for each criterion. A survey of twenty-six acquisitions librarians' value judgments relating to the three criteria showed no common values. It did reveal, however, that librarians working with tight acquisitions budgets place the highest value on discount.

Boissonnas (B) explored prices by examining 807 monographs acquired by a university library from seven vendors, four of whom used cost-plus pricing. Each was analyzed for the price stated in *Books in Print*, the vendor's cost and list price, discount, service charge, postage and handling, and total price paid. In addition, prices were obtained from that library and eight other academic libraries for 2,107 other monograph transactions, of which some 1,200 were common titles. No statistically significant difference in price was evident from cost-plus vendors as compared to other vendors. Statistically significant differences were found, however, between prices paid by the library (which acquired its titles by means of firm orders) and the other libraries (some of which received material on approval) for common titles. It was determined that vendors report list prices accurately, whereas *Books in Print* prices are unreliable (half of the time, either no price or the wrong price is listed). Although not conclusive, books received on approval may be cheaper than firm orders by 2%.

Vendor analysis is a time-consuming activity that is rarely reported, making these studies especially useful. Methodologies are also a welcome contribution to this area, especially when coupled with extensive data. The fact that 36% of ordered titles needed claiming at least once (including as many as 74% of the titles from one vendor) is a strong indication for the need for more efficiency in this process by means of automatic generation of claims and their electronic transmission to vendors. That the mean delivery time from at least one vendor was 205 days could dictate adjustments of claiming intervals in local automated systems and adjustments in vendor selection. This could also apply to the price study and its implications for the use of approval versus firm orders.

AUTHORITY CONTROL

The use of and need for authority control was at the center of much research, including a survey, a study of music uniform titles, the use of the Library of Congress Name Authority File (LCNAF) in RLIN, variations of personal names, and work in subject authorities. Time and cost studies of authority control are discussed in the cataloging section below.

AUTHORITY CONTROL AND ONLINE CATALOGS

Baer and Johnson surveyed the use of authority control by academic libraries with collections exceeding 250,000 titles. Responses from 171 libraries indicated that of the 37% with online catalogs, 18% had automated authority control, of which half had it linked to the online catalog. Automation required increased staff time for authority work, especially with linked authority files (58 hours weekly for manual systems, 88 hours for online/unlinked systems, and 146 hours for online/linked systems).

NAMES

In 1987 Dickson and Zadner examined the LCNAF on RLIN by analyzing its use by catalogers in an academic library. They searched 583 personal and corporate names derived from normal workflow in the LCNAF, of which 68% of the personal and 79% of the corporate names were found. The implication of right-hand truncation on matching on the MARC 100 field is examined, and additional analysis is provided for headings with and without cross-references, headings that match on cross-references, and correlation between date of publication, language, and the percentage of names in the LCNAF and names not in the LCNAF but in the RLIN bibliographic file. They conclude that despite the usefulness of the LCNAF alone, the bibliographic file is required to resolve conflicts. Changes to RLIN are recommended.

Taylor reported preliminary results of an investigation of the extent to which bibliographic records in the database of the OCLC Online Computer Library Center contain personal and corporate name variants that are not in the LC authority file. Of 900 sample records, 573 (63.7%) were found to have one or more names represented by an authority record, and 498 (55.3%) of these records had an authority record for every name contained on the record. Of the 900 total personal names contained in the sample, 517 (57.4%) had authority records, as did 257 (82.1%) of the corporate names represented. Of the personal names with authority records, 83.6% matched exactly, with 83.3% of the corporate names having exact matches.

Baer and Johnson also examined 454 personal and corporate names entering the catalog of an academic library for discrepancies, the need for references, and the presence of *see* and *see also* references in the LCNAF (in OCLC). The data showed that 42% of the corporate and 18% of the personal names would create new files (an average of 25%); an average of 14% would create split files.

Strunk examined the control of personal names by analyzing the frequency of titles with the same personal names, problems of form, and the benefits of possible authority control solutions. A sample of 1,116 Danish books revealed that 35% (390) had an identifiable authority problem, the most common being the same form of name for more than one person. Other problems, in order of frequency, were compound and hyphenated surnames and variations in the fullness of names.

Fuller studied the extent to which the form of a person's name varies in his or her works and examined the types of differences when they do occur. She used a random sample from a card catalog containing 324 persons whose names were verified on the cards or in the items themselves when necessary. Of the total, 81.5% of persons appear in only one form and thus do not require authority control; 61.9% were represented by only one catalog entry. When differences are present, the entry element is the most common difference.

Weintraub studied personal name variations by analyzing the names of 395 persons in the catalog of an academic library. Sixty-three percent of the persons had entries for more than one title, and 82% were uniformly named in all bibliographic transcriptions (a remarkable similarity to Fuller's analysis). Authority records for 67% of the names had no references. The fullness of forename was the most common variation when multiple forms of names exist. The author concludes that authority records are not needed for most individuals if retrieval systems employ keyword, Boolean, or right-hand truncation searching.

SUBJECTS

Frost and Dede examined the compatibility of subject headings between the catalog of a research library and the *Library of Congress Subject Headings* (*LCSH*) by comparing 3,814 topical and geographic subject headings from a sample of 2,401 bibliographic records in the library's catalog with those in *LCSH*, 10th edition. The goal was to establish a model to determine what automated authority control means could be used to convert the nonmatches to *LCSH* and the extent of manual intervention required. Complete matches existed for 44% of the headings (88.4% of the headings without subdivisions matched as did 87.7% of main heading components). The authors conclude that automated systems hold promise for the conversion of main headings and topical and chronological subdivisions. Problems would be encountered for geographic subdivisions unless free-floating lists were made available.

They noted that 94% of the topical subdivisions not matching *LCSH* were on the free-floating lists.

Drabenstott and Vizine-Goetz looked at the incidence of references and their structure in the following machine-readable LC Subject Authority File (LCSAF) fields for untraced references: 260 (general explanatory *see* references), 360 (*see also* references), and 680 (scope notes) that display to users of online catalogs but are difficult to control by systems software in the manner of traced references. In addition, 681 fields (references traced in *note/example under*) were examined. The database used for the study consisted of 160,706 subject authority records from 1987. Analysis indicated that an estimated total of 12,256 untraced references exist in the database's 260, 360, and 680 fields (requiring manual review), but only 7,005 tracings exist in 681 fields (leaving a difference of 5,521 not represented in the 681). The unreliability of the 681 field to trace the headings and subdivisions in the 260, 360, and 680 fields adds to the required cleanup effort. Suggestions are made for maintenance, cleanup, and review of these fields.

Uniform Titles

Smiraglia investigated collocating musical works by determining the percentage of all titles proper among manifestations of a given musical work that differ from the title proper of the first edition and, of those, the percentage due to variant languages and to the use of different titles. He also analyzed the occurrence of patterns among those titles proper that recur most frequently. A sample of 154 titles (79 generic and 75 distinctive) was checked in the National Union Catalog and OCLC. Multiple manifestations were found for 87.3% of the distinctive titles and 89.8% of the generic titles. Of the generic titles, 23.9% varied and 68.6% of the distinctive titles varied from the first manifestation (95% of the variations were due to language). The author observes that the data emphasize the need for authority control for musical works.

Research in authority control is perhaps the most theoretical work represented in this survey and would seem to have the least practical effect, at least in automated environments, given the relatively few automated systems incorporating it (although there is certainly a growing percentage). Research indicates that most personal names do not require authority control and that a high percentage are found in LCNAF. However, many names, uniform titles, subjects, and other entities present significant, labor-intensive problems requiring authority control.

AUTOMATION

Automation is at the heart of much of the research reported elsewhere in this survey. Three surveys included here address the implications of migrating from one automated system to another, changes in the relationship between local systems and the bibliographic utilities, and the benefits of network participation.

Anticipating the switch to a new automated system, Gyeszly and Harer conducted a survey to investigate the issues related to the implementation of automation, including organizational changes and training techniques, and to gather information to aid in developing training methods for their needs. The survey was tested and sent to various institutions using the same automated system. Two models of systems replacement were evident: one merely required different equipment and had little impact on organizational change; the other required changes in staffing, services, and functions. Staff increases were particularly evident in automation and training positions.

In 1989, Lowell surveyed twenty-five members of the Technical Services Directors of Large Research Libraries Discussion Group of the Association for Library Collections & Technical Services about the relationship between local systems and bibliographic utilities as projected for 1992. Selected results are arranged by function (acquisitions, cataloging, etc.). Respondents predicted an increasing reliance on local systems as their database of record and anticipated membership in more than one bibliographic utility. Van Orden and Wilkes reported the results of a survey of forty-nine school district media centers that are members of bibliographic networks or consortia to assess their perceptions of benefits of network membership and barriers to networking. The different methods of processing were also addressed, such as in-house or outside agency and the use of *LCSH* versus Sears.

This research reflected the real or anticipated changes in library automation during this period. It addressed the reality of many libraries moving to second- or third-generation automated systems and contemplating new relationships with bibliographic utilities. Membership in more than one bibliographic utility for many large libraries has, in fact, become a reality. The opportunities and capabilities presented by the changes in software, hardware, and local computing capabilities are reflected in these surveys.

CATALOGING

Research in the broad context of cataloging included traditional topics, such as shared cataloging quality and availability, workflow, costs, and backlogs, and the emerging topic of enhancing traditional bibliographic records.

CATALOGING BACKLOGS

A study of the availability of LC cataloging records in the OCLC database focused on the processing priorities of backlogs. In this work, White and Roos studied a random sample of 660 items that had been backlogged in a university library for one to two years. The goal was to determine whether certain categories of materials would have LC cataloging copy within a specified time, and conversely, whether there were other types of materials that should get local cataloging immediately if LC cataloging would be unlikely. The 660 titles had lower LC cataloging priorities than other materials, were more likely to be from foreign publishers, were received slightly more often as a result of direct orders, and were mostly scholarly materials in language and literature, fine and applied arts, and history. Ninety-one percent had cataloging copy in OCLC (31% of which was LC). The authors conclude that a significant amount of original cataloging will always be required for certain items and that by examining newly received books by subject, bibliographic format, and type of purchase, some categories of newly received items can be identified for immediate cataloging.

In estimating resources required to eliminate backlogs and the number of items in them that were still wanted, Rogers examined samples from a large academic library's two "historic" backlogs (containing some pre-1945 imprints), one sample comprising 990 general materials and the other, 559 Slavic language titles. Only 27% of the general titles were still wanted for the collection; of the Slavic material, 70% of the pre-1945 titles and 59% of the later titles were wanted. Cataloging copy was found for 87% of the total group.

The connection between the delay in cataloging of books and their circulation was studied by Gleim, who examined the eight-year circulation history of a sample of 1,452 items cataloged in a single prior year. The sample was segmented by equal samples of postreceipt cataloging delays of up to two months, two to twelve months, and more than twelve months. The data showed that there is a significant difference in mean circulations among books in the three categories: English-language books with the shortest cataloging delay circulated more often than others. There was no statistical difference for non-English books, which may indicate that libraries may choose to ignore foreign language books in their backlogs without circulation frequency consequences. A moderate cataloging delay of five months, however, for English-language books has little relationship to circulation.

These studies show that cataloging copy is likely to be found for as much as 87%–91% of backlogged materials, although many older materials are unlikely to be desirable for adding to the collection. English-language books with the shortest cataloging delay are likely to circulate more than other categories of material entering the collection from the backlog.

CATALOGING COSTS AND TIME ANALYSIS

Cataloging costs, workflow, and time analyses are of keen interest to technical services managers. The studies cited include work in cataloging, authority work, and production standards for catalogers. Fox and Preece's study of upgrading minimal-level cataloging is discussed elsewhere.

Binder, Gustafson, and Merritt surveyed eighteen regional catalog departments to determine the time spent on geological and geographical name authority work, the kinds of materials needing the most authority work, the kinds of features that were most difficult to formulate, and the methods used to find and resolve conflicts between local and LC practice. Among the findings were that state publications require the most authority work and that bodies of water are the feature requiring the most frequent work. Seven libraries refer conflicts to LC, the others to a regional or state agency or network.

Fiegen, Heitshu, and Miller compared costs over a three-year transition from a manual to a microcomputer-produced authority card production system. The number of hours per week devoted to this process dropped by 50%, costs were reduced by 19%, and accuracy was increased greatly. Prabha (B) analyzed cataloging time, excluding authority work, of 111 books from two libraries, one academic and one public. A stopwatch was used to time activity from the start of the database search in OCLC to adding the library's holding symbol. At the public library, the total mean time for copy cataloging of ten nonfiction titles was 15.20 minutes, with 28.80 minutes required for original cataloging. Fiction titles required only 3.50 minutes, partly because they required no classification. The academic library required 7.10 minutes for copy cataloging and 23.40 for original cataloging. Fiction, which was classified, took 7.55 minutes for English and 14.86 minutes for non-English. The overall mean was 12.15 minutes for the public library and 11.20 minutes for the academic library.

Prabha (A) also studied name and series authority work performed by copy catalogers in a research library using NOTIS and OCLC. The processing of seventy-six books was timed with a stopwatch with the average total cataloging time, including authority work, taking eleven minutes per book. Dickinson Nichols analyzed 205 surveys returned from various California libraries. The surveys assessed, among other information, sources for cataloging copy, annual average titles cataloged per FTE (the range was 1,120 to 1,609), call number acceptance on cataloging copy, and an indication of the relative importance of thirteen assumptions underlying classification decisions (which was the focus of the survey). The data are presented by library type. The findings indicate that smaller libraries and catalogers working in libraries using the *Dewey Decimal Classification* (*DDC*) are likely to spend more time than those in other settings on classification review and revision.

Cataloging production standards were investigated by Smith, who analyzed eighty-three returned surveys from academic libraries with holdings exceeding 250,000 volumes. Only about half of the libraries reported any standards, and the other half share little in common with regard to standards (with productivity varying several hundred titles per month). There was general agreement, however, that sound recordings are the most time-consuming type of material to catalog; monographs are the least burdensome; serials, audio-visual media, and scores fall in between. Standards are not affected by differences in cataloging routines or percentages of time spent on cataloging. The author suggests that these topics could be the basis for another study.

Calhoun discusses the determination of costs associated with producing and maintaining the public card catalogs in an academic library. Typical of many methodologies, job logs were developed and filled in by staff during a specified period (one week) in 1984. Catalog maintenance required 2.74 FTE staff, of which 2.58 were clerical. Harris analyzed 117 surveys addressing cataloging costs returned from large academic libraries. It is not surprising that 69.2% have unknown cataloging costs. The others reported an average cataloging cost for a monograph in 1985–86 of $17.17, although the author cautions that this is a conservative and rough estimate given the nature of the responses. Cataloging quality is valued by 64% as of the highest importance. A historic survey of costs is included.

In 1985 Hood and Miller compared the costs associated with maintaining a traditional card catalog, an online catalog, and the existing computer output microform (COM) catalog at an academic library. Given the local circumstances, an online catalog was the least expensive, the card catalog the most expensive, and the COM catalog in between. The methodology is described and discussed.

These studies confirm that certain processes and materials are more time consuming and costly to catalog than others. Sound recordings, bodies of water, and state publications emerged as the most difficult and time-consuming entities to catalog. The indication that there is a general lack of awareness of cataloging costs is juxtaposed with methodologies of cost analysis.

CATALOGING RULES AND THEORY

Application of cataloging rules and theoretical concepts is an area where little research is represented in this survey. In addition to the two works cited here, Mering's study on latest entry serials cataloging is included in the serials section. Ercegovac studied the concept of map authorship by conducting an empirical project that included interviewing and surveying map catalogers and examining cataloging examples of 178 maps in OCLC. The author concludes that the functions of research and design (resulting in the content and style of a map) are regarded as the most essential elements of map authorship.

It is a welcome approach when preferences of the user are taken into account in rule formulation and revision. This was the case in the study by McGarry and Yee, who sought to determine the existence of empirical evidence indicating which of several cataloging methods should be used to identify conference proceedings. They analyzed 240 responses from a survey of reference librarians in large libraries. The survey focused on users' searching behavior and preferences for finding meetings identified only by the name of the sponsoring corporate body and the generic term for the meeting. The results indicated a preference for searching under the corporate body holding the meeting; few want to search under the direct entry for the name of the conference. Implications for cataloging rules are discussed.

EXPERT SYSTEMS AND AUTOMATED CATALOGING

Expert systems and other automated aids in cataloging comprise a fascinating and potentially revolutionary area in the cataloging process. Meador and Wittig analyzed *AACR2*, Chapter 21, rules for establishing access points for thirty books in economics and chemistry and tested three hypotheses affecting the appropriateness of expert systems for cataloging. Only 8% (12 of 143) of the rules were used in assigning main and added entry headings for the economics books and 15% (22 rules) in chemistry, which suggests that a single expert system could be developed as well as separate systems by subject. Svenonius and Molto investigated the feasibility of automatically deriving name access points from title pages in machine-readable form of English-language monographs. Using two samples of 216 books each, name access points were identified with an overall success rate of 87.62% and a precision of 95.23%; corporate body and title main entries were considerably less successful. Approximately 88% of the access points selected for these items by LC or NLM could be derived automatically from title page data.

The indication that a high percentage of personal names can be automatically derived from title page information using only a small percentage of *AACR* rules provides a considerable boost to the hopes for enhanced automated cataloging processes.

LENGTH AND LEVEL OF CATALOGING RECORDS

Trends in the length of records were the subject of research by Harris. To determine whether there was a trend before 1982 toward briefer catalog records, he compared ninety-nine samples each from the *National Union Catalog Pre-1956 Imprints* and the *National Union Catalog* (1982) and found that the number of characters increased by 24.5%, the number of entries by 130.2%, the number of fields by 96.9%, and the number of subject heading subdivisions by 156.2%. Note that the data were collected prior to the increase in minimal-level cataloging that occurred after the mid-1980s. The cost analysis included in this study is discussed above.

Fox and Preece studied the implications of upgrading minimal-level cataloging by analyzing 190 of 200 minimal-level records entering a cataloging department during a one-year period. These were searched in OCLC for changes four months after the project began. By that time, 25% had been changed or replaced by LC source records. By the end of the project, the library had upgraded 134 records (70%), while other libraries had upgraded 56 records (30%). The length of time the 134 records had been in the test library's shared online catalog (ILLINET Online) prior to upgrading ranged from one week to twenty-four months. The number of changes made to variable fields averaged 8.24 per record for the entire sample (MARC 6xx fields were the most changed or added fields). The data indicate that upgrading requires reviewing the entire record, that minimal-level cataloging guidelines are inconsistently applied by other libraries, and that a high level of staff is required for upgrading.

As this research shows, the significant lengthening of catalog records (until at least 1982) was not reflected in the subsequent contribution of minimal-level records to the national databases, which caused libraries to upgrade this cataloging at significant cost in staff resources.

LOCAL CARD CATALOGS AND ONLINE CATALOGS

Cook and Payne compared the accuracy of a card catalog with that of an online catalog created from the library's archival OCLC records and a retrospective conversion project. Using a sample of 1,954 records from the shelflist, they determined that the online catalog was 99.28% intact, whereas the card catalog was 99.38% intact. There were discrepancies, however, in errors in title fields (1.35% online versus 5.89% card catalog), subject fields (1.05% online versus 5.97% card catalog), name access (0.54% online versus 9.72% card catalog), and series (5.76% online versus 10.94% card catalog). This study can be compared to Knutson's (A), which compared records in a card catalog to those in a new online catalog for accuracy and types of errors. The goal was to assess the feasibility of installing the online catalog without extensive cleanup and verification of headings and the impact installation would have on unconverted records. Much of the data in the online catalog had undergone processing by a vendor for cleanup and authority control, although raw OCLC records that postdated this process were also included. The focus was on access points, call numbers, and locations in addition to filing in the card catalog. The online catalog was more accurate in all categories except one in which the two were identical. The most common errors in the online catalog were call numbers and locations; the card catalog's most frequent errors involved missing or misfiled cards.

Given the promise of automation, it is encouraging to note that in these two studies the online catalog was considered more accurate than the card catalog.

ONLINE CATALOG CONTENTS AND ENHANCEMENTS

Enhancements or additions to traditional bibliographic databases and expanding access to catalog records are generating considerable interest and research, most of which is discussed in the subject access section below. Although this survey omits online catalog design, the following two studies indicate the use of data presently input into catalog records.

Barnes and McCue looked at common data elements such as ISSN, ISBN, CODEN, LC call number, and titles that could link MARC files with BIOSIS and Agricola. Of a sample of fifty Agricola serials citations, 92% were found in the online catalog of the study library; 76% of these were linked by ISSN, the most common linking element. The most common element for the Agricola monographs was the LC call number. The ISSN was the most common element in one of the BIOSIS samples, with the title the most prevalent linking field in a BIOSIS subset of citations from *Biological Abstracts*. Titles, however, are more problematic than numeric linkages due to variations in spacing, punctuation, capitalization, and filing indicators. Percentages of linkages for other elements such as CODEN are given.

Broadbent conducted a study designed to determine whether the online catalog can function as a dictionary catalog and a classified catalog without requiring additional time and intellectual effort by catalogers. To this end, 1,842 MARC records containing 2,735 subject headings were analyzed. Of these, 55% had LC classification numbers attached. An alphabetical and classified index was created and judged to be useful to an online catalog but not truly effective unless classification numbers are assigned to secondary subject headings also.

These two studies indicate that data presently available in MARC records will not provide complete linking mechanisms to certain citation indexes or provide a complete and adequate classified catalog.

SHARED CATALOGING

Availability

The availability of cataloging data in bibliographic utilities and other sources has long been of concern to catalogers and others in technical services. In addition to analyses of such availability in OCLC and RLIN, there was a report on a CD-ROM product. A study by Jacsó on serials cataloging data in *Bibliofile* is reported in the section on serials, and other related studies are reported above in the discussion of backlogs.

Barrett analyzed hit rates on the OCLC Cat-CD450 system by searching 224 primarily English-language books newly received on approval and representing a general mix of subjects. Searching occurred over a six-month period in three quarterly issues of the product. Its data comprised the 1.2 million records in the *Recent Books Cataloging Collection* containing the last six years of CIP and "most used" OCLC records. Cataloging copy was found for 92% of the titles immediately and 98% within one month (75% of which were CIP). The author concludes that the product is useful for libraries buying 1,000 to 5,000 titles per year or for specific situations in larger libraries.

Grover studied cooperative cataloging of Latin-American books by selecting 298 books from twenty-four Latin-American countries that had been received by three libraries during a three-month period in 1983. After six months, they were searched at six-month intervals in OCLC and RLIN to determine when they were first cataloged, which library provided the first cataloging record, and which libraries added holdings. After six months, 37% had been cataloged; 88% were cataloged after two years. No major differences were discerned between the total number of titles found in OCLC and RLIN, although there were differences by country of publication. LC cataloged about 50% of the titles in both OCLC and RLIN. The data indicate that only eleven research libraries are emphasizing the cataloging of Latin-American books although 315 libraries were indicated as owning at least one of the sample titles.

The presence of Russian monograph records in OCLC was studied by Gurevich, who examined 507 new Soviet imprints received in a five-month period in 1989–90. Records were found for 62.7% of the records, of which 18% were LC records and 22.1% had LC call numbers that could be handled by copy catalogers. In addition to the 25.2% of cataloging records lacking LC call numbers, 15.4% were sublevel records requiring professional catalogers.

These latter two categories plus the books for which no records were found made up 77.9% of the sample requiring professional catalogers. Recommendations for improved shared cataloging are given. The study of curriculum materials by Kranz (A) discussed in the following section revealed hit rates in OCLC ranging from 38% to 94% depending on the type of material.

Shaw searched OCLC for 200 titles from the *Publisher's Weekly* forecasts of fiction titles and 204 titles from a vendor's notification forms for health sciences titles, including prepublication and published titles (all from the same period). On the first search, only forty-seven titles had no record in OCLC (twenty health sciences titles and twenty-seven fiction titles). At eight weeks, only eight lacked records (seven health sciences, one fiction). It is interesting to note that 277 records had been in the database for more than 100 days (some for two years). CIP records accounted for 69% of the total.

As would be expected, research shows that shared cataloging data exist in varying quantity and quality depending on the type of material but can range as high as 98% for a given sample.

Quality and Content

The quality and content of shared cataloging data are as important as its availability. Research in this area included MARC elements, a survey of perceptions of the quality of records in OCLC, microcomputer software cataloging, a comparison of member-contributed cataloging in OCLC and RLIN, and a comparison of LC subject heading assignment by LC and the British Library. Van Avery's analysis of serials data is mentioned in the serials section.

Barnett (A) examined the use of MARC elements specific to technical reports in 211 monograph catalog records (from sixty contributing libraries) in OCLC for marine science technical reports. The study indicated that these MARC elements are used infrequently, and recommendations, such as requiring a *t* in the fixed field designation *Cont.*, are made.

Davis reported on a 1987 market survey by OCLC of 390 responding libraries assessing the quality of the database. The survey questions were mailed, and responses were gathered via telephone. General and specific quality issues were addressed, such as adherence to national standards, name and subject heading accuracy, and typographical and MARC heading accuracy. There are interesting differences in responses from academic research libraries as compared to the total. For example, the overall rating was 92.5% "excellent" to "good," whereas 76.9% of the academic research libraries gave a rating of "good" or "fair." Duplicate records were considered the most serious problem, followed by name heading and subject heading errors. Thirty-one percent of the respondents never report errors.

Kranz (A) analyzed cataloging records for curriculum materials in OCLC, focusing on the content of bibliographic records. Fifty randomly selected book and nonbook titles were examined for the presence of specific bibliographic elements that are indicated for each type of material and LC and non-LC source cataloging.

Kranz (B) studied microcomputer software cataloging in OCLC by examining fifty bibliographic records in OCLC input by various libraries from 1983 to 1986 (much of which was after the publication of *Guidelines for Using* AACR2 *Chapter 9 for Cataloging Microcomputer Software* in 1984). Frequencies of occurrence of various cataloging elements and MARC tags were tabulated and assigned subject headings analyzed. The author observes inconsistent application of rules in the file description, system requirements, and disk characteristics areas and makes recommendations for enhancing cataloging consistency. Intner reported on research conducted with McGarry comparing member cataloging in OCLC and RLIN. Analysis of 215 matched pairs of member cataloging records was conducted for errors and variations in fullness. Essentially no differences in the total number of errors were found: 537 in OCLC and 530 in RLIN (2.48 per record in the combined total), with similar error rates in the other elements analyzed. For example, eighty-four errors in descriptive headings were found in OCLC records as opposed to ninety-four in RLIN records; of these, twenty-six affected retrieval in OCLC and twenty-nine in RLIN. There were five substantive subject heading errors in OCLC and four in RLIN. No clear pattern was discerned regarding differences in fullness of cataloging records.

In comparing LC cataloging with selected RLIN member cataloging, McCue, Weiss, and Wilson used a total sample of eighty catalog records from LC and nine "best" RLIN libraries for items in the test library's backlog. These eighty items were in turn cataloged by each of the five members of the research team without reference to the RLIN bibliographic file and then compared to the member or LC catalog records. No significant differences were evident between the LC and member cataloging records. A comparative cataloging study by Tonta compared eighty-two titles cataloged by LC and the British Library for consistency of LC subject heading assignment. LC assigned 282 subject headings and the British Library assigned 127 (3.44 per title versus 1.55 per title). Forty-nine of the British Library headings matched exactly with the LC headings for the same titles.

Studies of the cataloging of special materials and formats indicate a need for improvement in interpreting rules and assigning MARC elements. There is essentially no difference in the quality of cataloging between OCLC and RLIN, and LC and RLIN member records.

Use by Other Libraries

Barrett produced a rare replication study (in the context of this survey) in her examination of the use of a library's cataloging records in OCLC. OCLC was searched in 1987 for 211 original records for marine sciences titles input between 1983 and 1986. The result was analyzed for the number of holding symbols and other data. Of the total, 45% had been used by other libraries (compared to the 42% reported in a 1986 study by Knutson not in this survey). The sample is broken down by monographs and serials, classification types (technical reports, symposia, etc.), year of publication, etc. Catalog records for items published by the library's institution were the most heavily used, suggesting that cataloging publications of one's home institution should be given high priority.

The importance of a single library's contribution to a shared cataloging environment reinforces the benefits of this practice and provides interesting companion data to that presented in the studies on cataloging availability.

CLASSIFICATION

The use of different classification or shelf arrangement systems is a traditional topic and is the subject of two works. Crow surveyed shelf arrangement systems for sound recordings using data from ninety-two surveys returned by academic music libraries with more than 5,000 sound recordings. Arrangement by accession number is used by 66%; 12% use LC classification (although considerably more use LC classification for books and scores). The greatest satisfaction level was the 84% rating for accession number arrangement. This study replicates and compares data to Stevenson's 1963 survey that included public libraries. In that survey, 57% of the libraries used a classified arrangement, and 43% arranged sound recordings by accession number or manufacturer's number.

Shiflett compared the subject scatter between Superintendent of Documents Classification (SuDocs) and Library of Congress classification (LCC) by analyzing a sample of LC-MARC records that contained SuDocs numbers. Little relationship was found between the shelf arrangements implied by the two systems. A switch from SuDocs to LCC would cause significant changes, with the benefit of more shelf collocation and thus more convenience to the user.

PRESERVATION

This survey is highly selective in reporting on research in preservation, excluding, for example, work in paper chemistry and similar technical studies. The research reported here concentrates on library and process-centered topics, such as analysis of collections, surveys, and reports of projects and case studies.

ANALYSES OF COLLECTIONS

Analyses of collections were the subject of three studies. In 1989, Butler tested the pH of 400 sample books that were acquired by an academic library in 1987. The sample (which excluded U.S. government documents, academic presses, and non-American publishers) included books from 163 publishers—368 hardcover and 32 paperback titles. Of the books carrying infinity symbols or acid-free statements, 4% were acidic. These were part of a total of 130 books testing acidic; 270 tested alkaline (of which only 52% carried an acid-free designation or had an ISBN acid-free qualifier). Of the paperback books, 78% tested alkaline. It was projected that from 63% to 72% of the library's U.S. imprints are acid-free.

Chrzastowski and others surveyed a sample of 384 bound items in the stacks of an academic library and evaluated each for condition of paper, binding, and boards and covers. The analysis indicated that 29.4% were in good condition, 33.6% moderate, and 37.0% poor. These results are compared to an earlier study at Stanford University. Curtin, Harger, and Yasue monitored the pH of newly acquired books as a follow-up to an earlier study by McCready. They tested some 800 monographs added to the collection of an academic library, including hardcover and paperbacks from U.S. and foreign publishers. Chlorophenol red was used on samples of the papers to determine pH. Of the total sample, 35% tested alkaline, 11% slightly acidic, and 54% acidic. Of the U.S. imprints (37% of the total), 66% were alkaline (of which 29% carried an acid-free designation). Five acidic U.S. imprints carried an acid-free statement.

It is discouraging that no more than 78% of newly acquired books tested as acid-free in two of these studies and that only 63% of one library's collection was estimated to be in moderate or good condition. The false use of acid-free symbols by publishers is equally distressing.

PRESERVATION METHODS

Deacidification treatment techniques received considerable attention during the four years of this survey. To assess their benefits, McGee proposes a numerical system to measure the extended and enhanced useful life benefits (EEUL) of deacidification treatment programs. Mijland, Ector, and Van Der Hoeven describe an assessment of the paper quality of archival materials using a folding test and compare it to the Stanford method. The study included correlating pH with the number of folds required for breakage. The method is deemed useful for analyzing archival documents.

GENERAL STUDIES

Other research focused on life expectancy, preservation efforts for older periodicals, preservation practices, selecting for preservation, and a cost model.

Brown and Gertz tested the applicability of Atkinson's three-part classification for preservation selection (as modified by Margaret Child) to college libraries. They examined 1935 titles in LC classes P and PA for physical condition and the number of users over an eight-year period. Those items considered "low use long term research" (class type 3) were searched in OCLC, RLIN, and the *National Union Catalog Pre-1956 Imprints* for other library holdings. The data suggest that Atkinson's typology is suitable for college libraries that own sizable collections of class 3 materials. For example, 96.5% of the test library's class 3 titles were held elsewhere, but only 24.5% were held by five or fewer libraries.

The only research in this survey dealing explicitly with archives is a survey by Conway, who analyzed 320 surveys returned by archivists to assess their preservation activities. Jacobs analyzed the results of a questionnaire returned by fifty-six college libraries querying them on their treatment, handling, and preservation techniques as applied to nineteenth-century American and British periodicals. In addition, the respondents were asked whether the preservation needs of these materials influence collection management policies. They also were asked to provide general information regarding preservation resources, programs, facilities, staff, and budgets. Only one library had a written preservation policy, only 20% had made a survey of its preservation needs in the past five years, and there was little general evidence of defined preservation decision-making structures.

Harris, Mandel, and Wolven present a cost model that associates costs with the various processes involved in preservation, such as staff time, supplies and equipment, and contractual and bibliographic utility costs. Presley followed up an earlier study of paperback books by analyzing the life expectancy of the books in that study. A sample of 188 paperback books that had been sent to the stacks unbound five years earlier were examined. The analysis confirmed the earlier decision not to bind paperback books, as only eight titles needed binding even though 72% of the titles had circulated during the intervening years. It was confirmed, however, that circulating a paperback makes it more probable that it would be damaged. Little difference in durability was observed between glued and oversewn books. The authors recommend binding paperbacks only if a specific situation warrants it, and they estimate that 3% of paperbacks will need binding after four years.

The indication not to bind paperbacks is an important practical consequence of this research. The general lack of preservation efforts and planning in college libraries is cause for concern.

SERIALS

Research related to serials occurred in the areas of cataloging, standards, and costs and in a comparison of two CD-ROM serials directories. Although there is considerable research occurring in the broad area of serials, much of it is focused on the use of journals, cost-benefit analyses, pricing, cancellations, etc., which were outside the scope of this survey.

SERIALS DIRECTORIES

Of the few efforts pertaining to CD-ROM products in this survey, Jacsó (B) compared the coverage and accessibility of two CD-ROM serials databases, *Ulrich's Plus* and *EBSCO-CD*, as part of a general comparison of the two products. A list of 423 serials was searched by title and ISSN (when available) against early 1989 editions of the two databases. Of the 423 titles, 318 (75%) were in *Ulrich's*, and 268 (63%) were in *EBSCO*. Sixty-four titles were found only in *Ulrich's*, only 20 titles in *EBSCO*. The two databases combined contained 246 of the titles; 93 titles were in neither product. Comparative results are also provided for searching by subject, ISSN, keywords, and other access points.

SERIALS CATALOGING

Serials cataloging as a specific topic received modest attention. Included here are a study on the availability of cataloging data, one related to latest entry cataloging, and a study on the suitability of shared cataloging data.

As part of a detailed description of *Bibliofile* (version 4.03), Jacsó (A) searched a sample of 423 serials titles for inclusion in the *Bibliofile* database of some 500,000 serials records. The sample was drawn from the serials collection of the Computer Science Library and Information Center in Hungary. Seventy-two percent (304) of the titles were found. Excluding the 92 Hungarian titles, 89% were found. The database contained 47% of the West German and 80% of the titles from Great Britain.

Mering pursued a pertinent topic by studying whether a library should follow Northwestern University's lead in returning to latest entry cataloging, a prospect made easier by automation. The study examined 486 serial records to determine which had never changed title (55%), had straight-forward title changes (29%), or had more complicated changes (16%). These data plus the perceived problems in correlating the local results of latest title entry with the successive title requirements of the national utilities suggest that latest entry cataloging would not be worth the effort.

The question of quality and suitability of shared cataloging data for older serials titles was studied by Van Avery, who examined serials records for 357 titles undergoing recataloging. The titles were originally cataloged by her library before 1976. RLIN was searched in 1988 for the "best available" cataloging records. Although 274 titles were currently published, only 39% had records cataloged according to *AACR2*. LC records were judged "best" 75% of the time. Titles in a smaller sample of seventy-four records were examined more closely to determine the types of editing required. Of these, 24% (eighteen records) contained successive titles that required the creation of new records, 8% (six) required a change of main entry, 15% (eleven) required new or revised added entries, and 34% (twenty-five) required new or revised subject headings. In all, 55% (forty-one) required some revision.

As important as shared cataloging databases are for the availability of cataloging data, their requirements for latest entry cataloging and lack of currently acceptable cataloging data for older serials titles dampen their usefulness according to these studies.

SERIALS PROCESSING COSTS

Anderson reports on a 1984 cost-analysis project for serials workflow in an academic library. Sample data are included and the methodology is described as suitable for other libraries. In a related effort, Haack Lomker includes a method for analyzing serials check-in costs and presents data from three academic libraries, gathered in 1985, as a test of the methodology. Le Guern, writing from a special library's perspective, reports on the costs associated with automating a small library's serials acquisitions processing using dial-up connectivity to a serials vendor. Cost savings are represented in this study, which covered the years 1983–88. The methodology described below by Pitkin to analyze general technical services costs was used subsequently at another academic library to compare a manual and an automated serials control system. The library subscribed to 4,878 serials and projected an annual savings of $3,122. After three years, the same methodology indicated an annual savings of $10,000.

SERIALS STANDARDS

Although several of the works in this survey touch on standards to some degree, the only specific citation stems from the efforts of the 1988 ALA RTSD Serials Section Committee to Study Serials Standards (reported by Tseng and others). A survey was administered to a variety of libraries to measure, among other things, the use and awareness of serials standards, the types and levels of training for standards, and the benefits and perceived needs of standards in specific areas. There were ninety-four responses, including sixty-nine from academic libraries, indicating that a majority were not using most of the standard serials formats and most technical services librarians were unaware of serials standards. Recommendations are made for improvement.

SUBJECT ACCESS

Work in subject access included traditional analyses of *LCSH*, its applicability to specific subjects, and newer topics brought on by automation, such as enhancing subject access in online catalogs through the addition of tables of contents and other data.

APPLICATION OF SUBJECT HEADINGS

The application of LC subject headings (or other schemes) to specific areas is a well-established research topic. Work is reported here on French fiction, films and video, and women in literature.

DeHart and Matthews (A) examined fifty monographs in French literary criticism (forty-four titles) and literature (six titles) drawn from OCLC to determine whether the assigned LC subject headings represented the subject content of the descriptors of the online *MLA International Bibliography*, and if not, whether such equivalent headings could be formulated from *LCSH*. Also examined was the extent to which LC subject headings represent the code categories of the MLA records. Of the nineteen MLA codes, fourteen were used in assigning 348 descriptors that were represented by 157 LC headings (45% of the MLA descriptors). An additional 16% of the

MLA headings could have been formulated from LC headings; 39% of the MLA descriptors had 134 equivalent LC headings that were banned from usage by *LCSH* policy. LC headings lacking equivalent MLA descriptors totalled 191 (55%).

Maillet compared the subject headings assigned to 100 educational films under PRECIS, *LCSH* (8th ed. and supplements), and *The NICEM Index to 16mm Educational Films* (7th ed.). PRECIS provided more comprehensive coverage (both general and specific headings), assigned to more films both topical and nontopical headings, and assigned more single-word access points than the other systems. The author concludes that PRECIS is an ideal system for media. Mowery examined 164 LC catalog records as found in OCLC for titles drawn from lists of history and criticism of literature related to women's studies. LC's use of subject headings and classification numbers was analyzed. Although more than 100 classification numbers and spans of numbers were used, most were classed in PN, PR, or PS. There was less variety in LC subject headings with more than half comprising "literature" headings containing the terms "women," "feminism," "feminist," or "sex role." "Women in literature" appeared on forty records. More than one-third of the books were studies of individual authors and had only that author as the subject. "Women authors" appear in different headings associated with forty-five books.

This diverse research indicates a much higher correlation of MLA index terms with *LCSH* equivalents than vice versa (an indication that PRECIS is an ideal system for media) and that most materials in women's studies are classed in three classification numbers with more than half assigned "literature" subject headings.

ASSIGNING HEADINGS

The process of assigning subject headings can provide research in a number of areas, including workflow, time and cost, and quality control. A related work comparing headings assigned by LC and the British Library is cited in the section on cataloging.

Chan pursued a study designed to develop a methodology for analyzing indexer consistency in MARC records and to study indexing consistency in subject cataloging between LC and non-LC librarians. One hundred pairs of records representing member records in OCLC and their LC replacements were analyzed and sorted by patterns of variation. LC records averaged 12.63% more headings than non-LC records (2.14 per record to 1.9). Fifteen pairs were perfect matches with regard to the number of headings and their form (six of these required no subdivisions); eighty pairs had some headings that matched completely or partially. Five pairs had no matching elements. Thus the data indicated that total consistency is rare; partial consistency is the norm. There was frequent variation in topical subdivisions. The author recommends more simplification in the use of *LCSH* and suggests that lists of authorized headings from LC MARC records containing unprinted headings and free-floating subdivisions would be helpful.

Veléz-Vendrell, Halverson, and Salas-Tull reported on a program to facilitate the assignment of subject headings for theses and dissertations. They analyzed forms containing subject headings suggested by the authors of 395 theses and dissertations, including *LCSH* terms and other terms considered more appropriate by those authors. Of the forms submitted, 64.3% contained LC headings actually used by the cataloger, and 28.2% of the forms had useful terms for the cataloger. Sixty-one percent of the forms suggested terms more specific than *LCSH* terms, thus bolstering the authors' claim that *LCSH* terms are too general for theses and dissertations.

Total consistency between LC catalogers assigning *LCSH* terms and other catalogers assigning them is rare, suggesting a need both to simplify the rules and to provide more information on unprinted headings and free-floating subdivisions. Other research indicates that *LCSH* terms are too general for theses and dissertations.

ENHANCING BIBLIOGRAPHIC RECORDS

Enhancing subject access to bibliographic records was the focus of several projects and represents a growing body of literature. Byrne and Mico described a project to add terms from contents pages of books (and indexes where necessary) to the MARC 653 field for 6,139 books, resulting in an average of 20.7 headings and 53.6 terms per book. A search of 100 keywords in computer science against *LCSH* terms, the additional terms in the 653 field, and title fields matched 15% of the documents against *LCSH* terms, 72% against the additional terms in the 653 field, and 10% against titles. "Fake drops" and other issues are discussed. One full-time clerk was required to photocopy pages and key in data that required catalogers fifteen minutes per item to identify.

DeHart and Reitsma examined thirty-one single-subject monographs in order to analyze their tables of contents for terminology in the context of assigned LC subject headings, work titles, and front matter written by the authors of the books. They determined that a functional relationship exists between these four elements. An average of 19.5 "content-indicative terms" per title were found in the tables of contents. Although 86% of chapter titles required context for more precise meaning (prompting the suggestion to assign LC subject headings for them), only 3% of contents terms were misleading. Of the assigned LC subject headings (OCLC records were the basis for the study), 85% were coextensive with table of contents terms. Forty-one terms in the work titles were not represented by assigned LC subject headings. Front matter in only four books indicated subjects not conveyed in the assigned LC subject headings. Recommendations are made for online catalog design based on the study.

DeHart and Matthews (B) investigated supplementing LC subject heading access in an online catalog by adding subject access from tables of contents, abstracts from *Choice*, and reviews from *Computing Reviews* for thirty-six books on information and computer science. Unique terms were identified, as were potentially misleading terms found in the sources and the book titles themselves. Their findings indicate that accessing indexed chapter title information along with LC subject headings to provide context may be helpful for a searcher as a first step. The searcher could then browse full-text tables of contents, abstracts, and reviews.

Dillon and Wenzel investigated how effectively enhanced records could be retrieved when abstracts and tables of contents were searchable in a database of 4,893 bibliographic records. They concluded that such inclusion enhances mainly the "recall" or retrieval of records rather than the "precision" or percentage of relevant records. The correlation between title words and *LCSH* terms (which has online catalog searching implications) was the focus of a study by Frost, who analyzed 2,268 records by matching title words with LC subject headings. The results, ranked by degree or level of match, found that 11% were exact matches, defined as matching the entire subject heading with or without subdivisions. The highest percentage was for science and technology books that also had the highest percentages in the combined categories. In 53% of the records, a title term would match at least one word in the subject heading. This figure would be 75% if truncation is considered.

The semantic relationships between title phrases and *LCSH* were analyzed by Fernandez, who paired eighty-two title phrases (derived from the "partial multiple heading match" category in Carlyle's study discussed below) with LC subject headings and categorized them according to five semantic categories: hierarchical, relational, totally synonymous, nearly synonymous, and no relationship. Most were hierarchical (53%) of which 74% had a title phrase term with a higher level of specificity than *LCSH*. The relational category applied to 27% of the headings. Implications for catalog use are discussed.

Knutson (B) correlated enhanced records with circulation activity by comparing circulation activity of 291 books divided into three groups: one group having an average of five subjects and contents notes added, another with contents notes but no additional subject headings added, and a control group of normal catalog records. Those with added subjects and contents had increased circulation activity but not those with just contents added. The possible effects of keyword searching and online catalog display on the results are discussed. Drabenstott and others conducted a project to add and index subject terms from the *Dewey Decimal Classification Relative Index and Schedules* to a sample database in an experimental online catalog. Based on the retrieval experiments of the online catalog users, they determined that the *DDC* terms contributed significantly to subject access. Michalak reported on the percentage of books that qualify for enhancement by containing tables of contents or separate contributions, such as anthologies, essays, collections, and exhibition catalogs. Of a total of 10,835 newly acquired books (excluding technical and scientific conference proceedings), 7.85% qualified for enhancement.

The addition of terminology and indexable data from tables of contents, chapter titles, abstracts, and *DDC* subject terms can enhance subject access to certain materials. The percentage of materials qualifying for certain of these enhancements, however, may be rather small, and there may already exist a high correlation between title terms and at least one word in the assigned *LCSH* if truncation is taken into account. The addition of indexable contents information alone did not increase circulation of those items, although the addition of *LCSH* terms with searchable contents information did increase circulation.

USE OF SUBJECT HEADINGS

Accessibility, usefulness, and the correct interpretation of LC subject headings are study areas well adapted to automation. Three studies are relevant to this survey. The survey by Binder, Gustafson, and Merritt discussed above also asked faculty and graduate student catalog users about their use of geological and geographical names in searching. The responses indicated a desire for more such names in the forms the users are likely to use. Suggestions for more references, keyword searching, etc. are given.

Carlyle discusses four previous studies that defined matching categories of subject headings and tested them in the catalog. Using data from a local online catalog, 161 subject searches were analyzed, providing examples of categories of matching terms. These were defined in terms of keyword searching and were categorized from exact match through, for example, "multiple heading match with abbreviation variation," to no match. Compared to other studies, wide differences were obtained for "exact" matches. The hierarchical arrangement and categorization of matches illustrates how enhancements such as keyword and Boolean searching and interactive authority files can benefit an online catalog. As part of a larger study, Drabenstott and Vizine-Goetz (A) compared 34,272 assigned subject headings (MARC field 650) in OCLC with authorized headings in LCSH-mr (MARC fields 150 and 450). Only 6.9% were exact matches, although with subdivisions removed, 75.5% matched exactly.

This research indicates a need for more commonly used terms for geological and geographical headings, reinforces the benefits of keyword and Boolean searching and interactive authority files for subject searching in online catalogs, and indicates a 75.5% correlation between assigned headings in OCLC and *LCSH* discounting subdivisions.

TECHNICAL SERVICES COSTS AND ORGANIZATION

In addition to the specific cost studies cited above in the acquisitions, cataloging, and serials sections, the following studies and models are included. These include surveys, case studies, and analyses of library operations, methodologies, and a model.

COSTS

Bedford reported preliminary data from a survey, begun in 1983 and completed in 1986, of the costs of technical services at twenty-six large academic research libraries. Of the seven functional and three cost categories, only four libraries could furnish data for all the categories. Observations included the following: (1) the lack of consistent management practices among libraries may account for a significant variation in resource hours for a particular function; (2) unit costs and total costs appear to be affected by the varying degrees of system fragmentation affecting processing (e.g., decentralization or specialization by format or languages); and not surprisingly, (3) automation affects costs. Cochrane and Warmann analyzed costs of all library services at an academic library and provided separate costs to purchase, catalog, bind, and shelve monographs and serials. Information was collected by interviewing library managers for data and adding university overhead costs. Using 1987 data and including "collection development," the authors concluded that costs were $106.22 for monographs and $180.86 for serials and periodicals.

In an effort to quantify quality in technical services, Mandel proposes a model for cost-benefit analysis that incorporates identifying the actions or policies to be analyzed, determining all costs and benefits and assigning them monetary values, calculating the net benefits, and making a choice. Hypothetical examples are provided, such as cataloging time versus user search benefits. Phelps (B) describes the methodology used to analyze technical services costs at a university library and Pitkin describes the methodology used in 1980 in an academic library to analyze personnel costs to acquire, catalog, and prepare an item for library use ($8.47). The use of this methodology for serials costs is discussed under serials.

Few libraries are able to provide comprehensive cost data for technical services, but available data indicate cost variations among libraries due to differences in organization, management practices, and use of automation. Total processing costs can be as high as $181 for a serial/periodical title. Quantifying quality in technical services can assist managers in making choices affecting processing time and costs.

ORGANIZATION

Surveys of catalogers to assess their changing roles were conducted by Eskoz. A project (Eskoz [A]) conducted in 1983–87 analyzed written responses from 106 heads of cataloging departments in academic libraries and follow-up telephone interviews with forty of them. The author concludes that with regard to organizational patterns, managerial responsibilities of professionals, and the level and type of cataloging performed by professionals versus support staff, changes are occurring slowly, and the traditional cataloging department structure is still largely in place. Additional results from these surveys were reported subsequently on the role of catalog librarians in public services (Eskoz [B]). Although most libraries maintain separate public and technical services divisions, some catalogers perform minimal time doing bibliographic instruction, reference, or collection development. A slight increase in these activities was reported over the time span of the survey.

The role of academic technical services librarians in Missouri in bibliographic instruction was assessed by Lawson and Slattery. Survey responses from twenty-five libraries indicated that eight libraries have technical services librarians involved in BI to some degree, although definitions and perceptions of what constitutes bibliographic instruction differed.

Changes are occurring slowly in the traditional organization and duties of catalogers and technical services librarians. A slight increase has been observed in their performance of bibliographic instruction, reference, and collection development activities.

SUMMARY

A topical review of the research cited in acquisitions includes data on the various materials supplied by approval vendors, the differences in focus represented by volumes of different monographic series (with implications for acquisition by standing order or approval), cost studies and methodologies for acquisitions, and vendor analyses. Authority control research included analyses of the LCNAF, including its use and content, the variation of the form of names, *LCSH* and *LCSH*-mr, and uniform titles. Three surveys constitute the works cited in automation, all of which reflected current trends and decisions in technical services.

Cataloging research included the processing of backlogs and the importance of backlogged material to the collection, cost and time analyses (which confirmed that certain materials and processes are more time-consuming and costly than others), map authorship, cataloging methods for conference proceedings (which included a survey of users' preferences), accuracy of online catalog data, enhancement of online catalogs with additional data or access, and shared cataloging. A survey related to sound recording classification and a comparison of shelf arrangement by LCC and SuDocs numbers made up the work in classification (LCC would provide more shelf collocation).

Preservation studies included analyses of collections, methods and practices, and a cost model. Work in serials comprised an analysis of directories, an analysis of the availability and quality of cataloging data, a determination that it is not feasible to return to latest entry cataloging, a discussion of processing costs, and a survey on standards that revealed little awareness of serials standards.

Work in subject access focused on the application of headings to specific areas, the process and consistency in assigning headings and their use, and an emerging topic of enhancing bibliographic records for greater subject access.

General research in technical services included work on costs, including models and methodologies, and surveys that included an investigation of the changing role of catalogers and technical services librarians.

OBSERVATIONS

A four-year retrospective of technical services research should permit a perspective of trends as well as current issues in the field. Except perhaps for the interest in enhancing traditional bibliographic records for increased access, it is difficult to perceive any trends diverging from what have become rather standard topics. To be sure, unique aspects and nonstandard topics are represented, such as expert systems for cataloging backlogs.

Most studies were published in refereed journals (including some stemming from presentations at conferences) and included a mixture of research techniques. Very few works are replications of earlier studies, few are the result of grant support, and although one-third are jointly authored efforts, few represent collaborations between teaching faculty and library practitioners. More specifically, two-thirds of the research represents field studies and one-fifth represents survey research, with the rest comprising experiments, methodologies, and models. Cataloging accounted for one-third of the research, followed by subject access, acquisitions, serials, and the other topics.

As would be expected given the varied nature, intent, and selection process of these articles, the overall adherence to strict research standards and presentation varies. Some general observations on these aspects would fit those raised by others such as Robbins.[3] For example, hypotheses (which are often not appropriate for this type of research) are rarely given, copies of survey instruments and dates of surveys or data collection are sometimes missing, literature reviews are not always present, and the use of statistical techniques varies. Stated methodologies were required for inclusion.

Some research presented here is forward looking where new ground is being broken, such as expert systems, authority control, enhancements to bibliographic records, and the presentation of some models; other research presents a traditional and more practical outlook. As in the past surveys, the "what" and "how" are much in evidence, although there is a welcome mix of the future.

A wealth of additional research ideas are suggested by many of the authors represented here as extensions of their research. In addition to these many suggestions (which have not been repeated here), more research is needed, particularly in technical services processes other than in cataloging and acquisitions (which are well represented). Such areas include binding preparation, serials check-in, spine labelling, bar coding, and preservation activities including cost and workflow comparisons and analyses. For example, cost comparisons and analyses are needed for libraries that mount their own LC MARC resource tapes rather than accessing these records in a utility. The cost benefits and staff implications of loading invoice information into local systems from serials vendors and for online interfaces to monographic vendors for orders and claims are other areas needing investigation. The impact of providing bibliographic and holdings data in an online catalog before items are available (due to shelf preparation and transit considerations) needs to be studied. Assessments are needed on the impact of placing a library's backlog in the online catalog on "demand" cataloging and the impact on claiming by making on-order information easily available in the online catalog. Cost comparisons are needed for in-house preservation and paperback binding as opposed to using the services of a binder. Similar cost and quality studies would be welcome comparing in-house and vendor-supplied database maintenance, authority control, and retrospective conversion. The timely receipt and thus the impact of items received on approval plans on original cataloging and backlogs (as opposed to firm-order purchases) needs investigating. The opportunities that these topics offer to the practitioner and researcher are rich and have important practical uses. Hewitt has commented on the usefulness of relevant research to technical services administration.[4]

In general, the body of research reviewed here represents a well-conceived, well-executed, and relevant corpus that speaks well for the recent state of research in technical services and bodes well for the future.

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Facilitating Geographic Subdivision Assignment in Subject Headings

Karen M. Drabenstott

The limitations of the existing files of Library of Congress name and subject authority records for indirect geographic subdivision are recognized. Recommendations for enhancements to existing authority records are made, which would enable online systems to assist in subject heading formulation and verify, with limited assistance by human intermediaries, whether geographic subdivision is authorized for use with a particular main heading and whether the correct form of indirect geographic subdivision is given. A study of subdivided subject headings in a large bibliographic database forms the basis of the recommendations.

Geographic names are widely used in name and subject access points. In subject headings, they are usually the main heading or subdivision, e.g., **Iraq—Aerial photographs** and **Small business—Ohio—Columbus,** or they may be part of a prepositional phrase heading, e.g., **London (England) in literature**. They are also used as qualifiers in corporate name headings, e.g., **Pioneer High School (Ann Arbor, Mich.)**.

The form of the geographic name in main headings and subdivisions differs. Main headings enlist the specific place as the entry element. Qualifiers are frequently added to identify the place more clearly or to distinguish it from other places with the same name. The Library of Congress Subject Headings system employs indirect geographic subdivision; that is, topical subject headings are subdivided by the name of the relevant country, then the appropriate subordinate political, administrative, or geographic division.

Machine-readable authority records give main heading forms of geographic names. Sometimes a cataloger can formulate the indirect form by flipping the geographic qualifier into the subdivision position preceding the subordinate division. For example, a cataloger can easily transform the direct form in the main heading **Dayton (Ohio)** into the indirect form for geographic subdivision, i.e., **Small business—Ohio—Dayton**. Unfortunately, flipping does not always produce the correct interposing element because of the many exceptions to rules for qualification of geographic name

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headings and for indirect geographic subdivision.[1] For example, Australia is an exception country. Qualifiers in main geographic headings for names of cities are abbreviated names of states and territories, e.g., **Melbourne (N.S.W.)**, **Brisbane (Qld.)**. However, the interposing element in indirect geographic subdivision is the country name, e.g., **Housing—Australia—Brisbane**.

Presently, authority records do not exist for indirect forms of geographic names. If they did, catalogers could "cut" indirect subdivisions out of authority records and "paste" them into the assigned topical subject headings they are formulating. The availability of indirect forms in authority records could also facilitate machine verification of assigned subject headings. In online cataloging systems, such capabilities would reduce spelling and typographical errors, minimize errors connected with indirect subdivision, and possibly, eliminate unauthorized use of geographic subdivision.

The purpose of this paper is to demonstrate the need for indirect forms of geographic names in machine-readable authority records to improve the quality and accuracy of subdivision assignment. The extent to which existing authority files contain main headings for the geographic names used in geographic subdivisions in the assigned subject headings of a large bibliographic database is described. Recommendations are made for authority record enhancements to enable catalogers and online systems to verify whether geographic subdivision is authorized for use with particular main headings and whether the correct form of indirect geographic subdivision is given.

RECOGNIZING THE NEED FOR INDIRECT FORMS OF GEOGRAPHIC NAMES

Since the early 1980s, the library community has called for machine-readable files to assist in subdivision assignment. An American Library Association (ALA) subcommittee recommended that machine-readable records for geographic names include the proper form of indirect subdivision.[2] Holley and Killheffer acknowledged the need for a machine-readable file containing geographic subdivisions to assist catalogers in indirect subdivision and subdivision records for nonjurisdictional geographic names.[3]

At the 1990 ALA Midwinter Meeting, the Committee on Representation in Machine Readable Form of Bibliographic Information (MARBI) reviewed a proposal to add a cross-reference machine-readable cataloging (MARC tag 552) or established heading field (MARC tag 152) to authority records for indirect forms of place names.[4] At the Library of Congress Subject Subdivisions Conference held in May 1991, the library community reaffirmed its interest in indirect geographic subdivision by urging the Library of Congress (LC) to investigate adding indirect forms of geographic names to existing authority records.[5] Since the working conference was held so recently, it is too early to determine how LC will proceed. The data and analyses of the study described in this paper could aid LC's decision-making process regarding the need for indirect forms of geographic names.

Of the four types of subdivisions appended to assigned subject headings, only form subdivisions occur more frequently than geographic subdivisions.[6] Almost 40% of the topical subject headings printed in the *Library of Congress Subject Headings (LCSH)* are accompanied by the designation "May Subd Geog," which authorizes the use of geographic subdivision.[7] Subject cataloging rules seldom allow geographic subdivision under name or uniform title headings.[8]

In machine-readable subject authority records, a one-character code called the Direct/Indirect Geographic Subdivision Code (byte 6, 008 fixed-length data element) is used to indicate whether indirect geographic subdivision is authorized. When records are coded "i," the cataloger has the option to add geographic subdivisions at the end of the heading or heading-subdivision combination. Many records coded with a fill character contain a heading-subdivision(s) combination that can be subdivided geographically, but explicit authorization for indirect geographic subdivision is given in another authority record containing one or more elements of the heading-subdivision(s) combination in the record at hand. It is possible to program online systems to interpret whether the fill character designates indirect geographic subdivision and to determine the optimal location of geographic subdivision in the subject heading string.[9]

The library community has called for machine-readable authority records for topical subdivisions.[10-12] The availability of such records would facilitate computerized authorization of subject headings subdivided by topical and geographic subdivisions because the authorization for geographic subdivision sometimes comes from the "May Subd Geog" designation accompanying topical subdivisions in the free-floating and pattern lists of the *Subject Cataloging Manual: Subject Headings* (*SCM:SH*).[13] For example, geographic subdivision in the assigned subject heading **Business—Economic aspects—United States** is authorized by the "May Subd Geog" designation accompanying the free-floating topical subdivision **Economic aspects** printed in the general *SCM:SH* list (i.e., H1095).

Online systems provide the "opportunity to detect errors before they are actually entered into a database . . . by incorporating the validation routines into the input/edit process."[14] In online cataloging systems, indirect forms of geographic names in machine-readable subdivision records could permit automatic error detection and correction with or without the assistance of human intermediaries. Several researchers have studied errors in assigned subject headings with the objective of categorizing them and determining automatic error detection and correction procedures to minimize error occurrences.[15-17] Online bibliographic system designers could integrate such procedures into a more versatile subject heading validation capability that would check for errors, determine whether the main heading or a free-floating topical subdivision authorizes the use of geographic subdivision, and validate the position of geographic subdivisions in subdivided headings.

RESEARCH QUESTIONS AND METHODS

Recommendations in this paper on the contents of machine-readable authority records for geographic names are drawn from a study of subdivided subject headings in a large bibliographic database. The study was a collaborative project of the Office of Research of the OCLC Online Computer Library Center, Inc., and the School of Information and Library Studies of the University of Michigan. Three of the study's research questions pertain to subject headings and geographic subdivisions:

1. To what extent do machine-readable and manual sources contribute subdivisions to bibliographic records?
2. What errors in subdivision assignment are connected with the different machine-readable and manual sources of subdivisions?
3. What enhancements are needed to the authority format to improve subdivision assignment and automatic validation?

The OCLC Office of Research provided Michigan project staff with a 0.1% sample of subdivided assigned subject headings for topical subjects and geographic names (MARC tags 650 and 651, respectively) from the OCLC Online Union Catalog. Assigned subject headings in the sample are unique strings consisting of one main heading subfield and one or more subfields for subject subdivisions.

Project staff studied topical subject headings separately from geographic subject headings. Staff categorized erroneous main headings, but they treated such headings as though the errors had been corrected. Subsequent analyses omitted unauthorized main headings, e.g., obsolete or made-up headings, because an intellectual decision would be required to replace them with authorized headings before determining what subdivisions were authorized with the newly assigned main heading. Staff then determined the source of geographic subdivisions appended to the main heading subfield by checking the following three sources in this order: (1) subdivisions printed in the thirteenth edition of *LCSH*,[18] (2) machine-readable subject authority records on OCLC, i.e., machine-readable *LCSH* (LCSH-mr), and (3) machine-readable name authority records on OCLC, i.e., LC name authority file (LCNAF). Staff also generated categories for the erroneous and unauthorized subdivisions they encountered with a view to making recommendations about the contents of machine-readable authority records that would reduce occurrences of such subdivisions in the future.

First-order political divisions do not require the name of any superordinate political, administrative, or geographic division preceding them. Examples are **Great Britain**, **Indiana**, and **Papua New Guinea**. Normally, the form of main headings and geographic subdivisions for first-order political divisions is the same. The form differs for subordinate political, administrative, or geographic divisions. The Michigan project team searched authority files for records containing first-order and subordinate political, administrative, or geographic divisions. The team treated subordinate divisions as though the authorized headings in retrieved authority records already contained cross-references for the indirect form. For example, the specific place named in the assigned subject heading **Registers of births, etc. $z Indiana $z Huntington County** would match the cross-reference for the indirect form of this name in the authority record for **151 Huntington County (Ind.)**, i.e., **552 $z Indiana $z Huntington County**. Acting as though cross-references for the indirect forms of place names were added to authority records, the team recorded the existence of errors in geographic subdivisions that would prevent online systems from finding an exact match of such forms in an automatic validation procedure. Examples of erroneous geographic subdivisions are presented in example 1.

When the team found an authority record for the place named in a geographic subdivision, they recorded the tag of the authorized heading in the authority record, i.e., MARC tag 151, unless the terminology of the place named in the subdivision was closer to the terminology of a cross-reference, i.e., MARC tag 451. For example, the terminology of the geographic subdivision **$z Guinea, Portuguese** in the assigned subject heading **Agriculture $x Economic aspects $z Guinea, Portuguese** matches the terminology of the cross-reference **451 Guinea, Portuguese** rather than the terminology of the authorized heading **151 Guinea-Bissau**.

When researchers did not find subdivisions for geographic names printed in *LCSH* or the direct forms of the places named in subdivisions in LCSH-mr or LCNAF, they placed them in a category named "Place not verified" and examined them for correct abbreviations and punctuation. They did not check additional sources to determine whether such places existed.

GEOGRAPHIC SUBDIVISIONS APPENDED TO TOPICAL SUBJECT HEADINGS

TYPES OF SUBDIVISIONS

The 0.1% sample of subdivided subject headings contains 2,903 topical subject headings. Geographic subdivisions are appended to 2,025 topical subject headings (69.8%). The majority (70.2%) of these topical subject headings are appended by one geographic subdivision. Two geographic subdivisions occur in 29.7% of the topical subject headings. One or more

Assigned Subject Heading	*Errors*
Law $z Uttar Pradesh (India)	Indirect subdivision
Probation $z Texas $z Tarrant Co.	Abbreviation
Real property $z Branch Co., Mich.	Abbreviation, punctuation, indirect subdivision
School integration $z Little Rock	Direct subdivision

Example 1. Erroneous Geographic Subdivisions in Assigned Subject Headings.

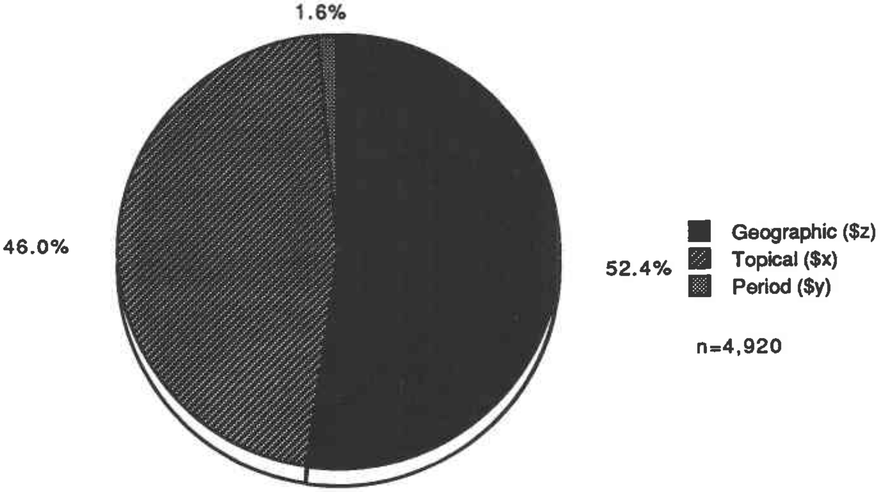

Figure 1. Types of Subdivisions Occurring in Topical Subject Headings.

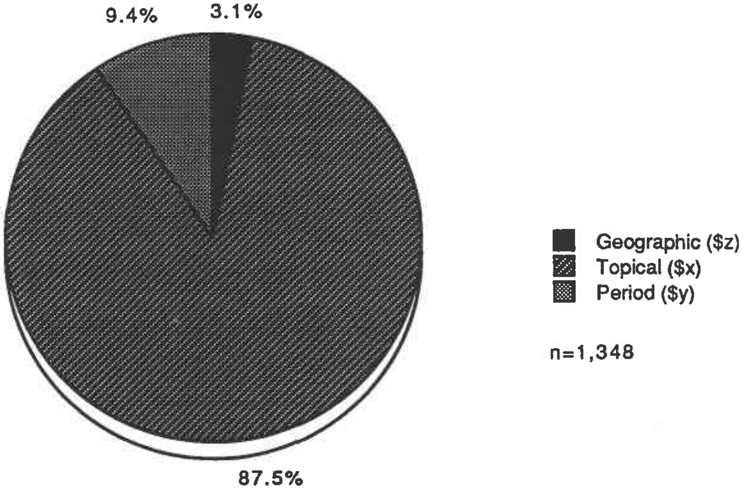

Figure 2. Types of Subdivisions Occurring in Geographic Subject Headings.

unauthorized subdivisions occur in the two topical subject headings appended by three geographic subdivisions. Figure 1 gives the percentages of the three types of subdivisions appended to topical subject headings.

The majority (52.4%) of subdivisions appended to topical subject headings are geographic subdivisions (i.e., subfield $z). Only 1.6% of the subdivisions appended to headings for topical subjects are period subdivisions. Topical subdivisions account for a large percentage of subdivisions (46.0%).

The 0.1% sample of subdivided subject headings contains 857 geographic subject headings. Geographic subdivisions are appended to forty-two geographic subject headings. Only one geographic subdivision occurs per geographic subject heading. Figure 2 gives the percentages of the three types of subdivisions appended to subject headings for geographic names.

Most subdivisions (87.5%) are topical subdivisions. Very few subdivisions (3.1%) are geographic subdivisions. In an analysis of LCSH-mr, researchers determined that 0.4% of main headings for geographic names are accompanied by the "May Subd Geog" designation that allows for geographic subdivision.[19] Thus, few geographic names printed in *LCSH* can be subdivided geographically. Examples of such names are **Alpine regions**, **Interstate 70**, and **Cumberland Road**. Most geographic subdivision for geographic names is authorized by the *SCM:SH* list of free-floating subdivisions under names of places (H1140). In this paper, geographic subdivisions appended to geographic subject headings are not discussed because most findings about geographic subdivisions appended to topical subject headings are the same for the few geographic subdivisions appended to geographic subject headings.

OVERVIEW OF GEOGRAPHIC SUBDIVISIONS

Categories of geographic subdivisions are enumerated in table 1. Over two-thirds of

TABLE 1

CATEGORIES OF GEOGRAPHIC SUBDIVISIONS

Subdivision Category	No.	%
LCSH-mr:		
First-order political division	1,752	67.9
First-order political division with free-floating phrase	6	0.2
Place requiring indirect subdivision	120	4.7
Place requiring indirect subdivision with free-floating phrase	17	0.7
Subdivision printed in *LCSH*	65	2.5
LCSH-mr Subtotal	1,960	76.0
LCNAF:		
Place requiring indirect subdivision	411	16.0
Place requiring indirect subdivision with free-floating phrase	26	1.0
First-order political division	18	0.7
First-order political division with free-floating phrase	1	0.0
LCNAF Subtotal	456	17.7
Remaining Categories:		
Place not verified in LCSH-mr or LCNAF	118	4.6
Place not verified in LCSH-mr or LCNAF with free-floating phrase	14	0.6
Unauthorized place name	29	1.1
Pattern	1	0.0
Authorized by *LCSH* scope note	1	0.0
Remaining Category Subtotal	163	6.3
Total	2,579	100.0

geographic subdivisions are first-order political divisions with machine-readable authority records in *LCSH*. First-order political divisions do not require the name of a superordinate division preceding them. The direct form of geographic names requiring indirect subdivision is available in LCSH-mr records for 5.4% of geographic subdivisions. Examples are **151 Chicago (Ill.)**, **151 Baltimore (Md.)**, and **151 Paris (France)**. For 2.5% of topical subject headings, geographic subdivisions are printed in *LCSH*. Examples are **Ethnology—Finland**, **Geology—California**, and **Heraldry—United States**. All together, LCSH-mr contains first-order political divisions or direct forms of places requiring indirect subdivision for 76.0% of the geographic subdivisions appended to headings for topical subjects.

When there were no authority records in LCSH-mr for places named in geographic subdivisions, the Michigan project team checked LCNAF for authority records. Of geographical subdivisions, 17.7% are verified in LCNAF records. The percentage of LCNAF records bearing the direct form of geographic names requiring indirect subdivision (16.0%) is greater than the percentage of such records for first-order political divisions (0.7%). A free-floating phrase such as **Metropolitan Area** or **Region** appends about 2% of geographic subdivisions for which there are machine-readable authority records in LCSH-mr or LCNAF.

Together, LCSH-mr and LCNAF contain records for first-order political divisions and the direct form of geographic names requiring indirect subdivision for 93.7% of the names in geographic subdivisions. The addition of indirect forms to machine-readable authority records would enable catalogers and online systems to verify most of the places named in geographic subdivisions.

Five categories describe the remaining 6.3% of geographic names. Places not verified in authority records account for 5.2% of geographic subdivisions. About 1% of geographic subdivisions are unauthorized. The one geographic subdivision authorized by a *LCSH* scope note is in the assigned subject heading **Campaign literature, 1835 $x Democratic $z Connecticut**. The scope note under the main heading instructs catalogers to qualify by date and subdivide by party and place. The one geographic subdivision authorized by a pattern is in the assigned subject heading **Slovak literature $z Foreign countries $x History and criticism**. The geographic subdivision **$z Foreign countries** comes from the Literatures pattern in *SCM:SH* (H1156) and is authorized because the main heading is governed by this particular pattern.

CROSS-REFERENCES AND EXCEPTIONS FOR DIRECT SUBDIVISION

Of the geographic subdivisions verified in LCSH-mr and LCNAF records, 95.8% use the terminology found in authorized headings, i.e., MARC tag 151. The terminology of cross-references, i.e., MARC tag 451, is used by 3.7% of geographic names in subdivisions. The remaining 0.5% are geographic names in Australia, Malaysia, and Yugoslavia. These countries are among the seven exceptions for direct subdivision that employ state (for Australia and Malaysia) and republic names (for Yugoslavia) for qualification of main headings.[20] These countries are not, however, among the exceptions for indirect subdivision.[21] For geographic names in these countries, the name of the country is interposed between the subject heading and subordinate place name.

FIELD 667 IN LCNAF RECORDS

On occasion, name authority records contain MARC field 667, Name Usage/Scope Note. According to the *USMARC Format for Authority Data*, this field "contains information about a 1xx name or uniform title heading that . . . is needed in the record to clarify the usage or scope of the heading in an established heading record."[22] Field 667 was redefined in Update No. 4 to the *USMARC format for Authority Data*, which was published in late 1991. It is called "Nonpublic General Note" and applies to names or subjects. It may be permanent or temporary, and may or may not be written in a form for display to public catalog users. The new name and contents are less restrictive than their earlier counterparts. When the researchers encountered field 667 in name authority records, the former name and definition applied.

For geographic names verified in LCNAF, the researchers encountered MARC field 667 in twenty-eight (6.1%) LCNAF records. They divided 667 fields into three field types depending on how they affect the place name: (1) no effect, i.e., information of little or no interest to subject authority work given; (2) no effect, interesting information given; or (3) effect that requires substitution of the heading when used as a subject with one traced in the Name Usage/Scope Note. Examples of each are:

1. **151 Punjab (Pakistan)**: "Substitute."
2. **151 East Pakistan (Pakistan)**: "The following heading for an earlier name is a valid *AACR2* heading: East Bengal (Pakistan)."
3. **151 Guanabara (Brazil : State)**: "SUBJECT USAGE: This heading is not valid for use as a subject. Works about this place are entered under Rio de Janeiro (Brazil)."

When the initial phrase in Name Usage/Scope Notes is "SUBJECT USAGE," the note usually traces a heading that should be used as a subject subdivision instead of the name in the authorized heading field. If newly defined Nonpublic General Notes use the "SUBJECT USAGE" designation consistently to indicate headings affected by the note, then systems could report the presence of only these Nonpublic General Notes to human intermediaries who would then review the note and heading. Catalogers could become indifferent to the system's alert because it would appear so often, e.g., in LCNAF records for commonly used places such as **Germany**, **Great Britain**, and **United States**.

PLACES NOT VERIFIED IN AUTHORITY RECORDS

Places not verified in LCSH-mr or LCNAF records account for 4.6% of geographic subdivisions. An additional 0.6% of places not verified in LCSH-mr or

TABLE 2

CHARACTERISTICS OF GEOGRAPHIC SUBDIVISIONS NOT FOUND IN LCSH-MR OR LCNAF

Notes about These Probably Valid Geographic Names	No.	%
Correctly constructed	78	59.1
More than one error present, e.g., direct or indirect subdivision error, abbreviation error	20	15.1
Qualifier error	8	6.1
Region, e.g., **$z Texas, Central,** or **$z Indiana, Southern**	7	5.3
River, e.g., **$z Hoko River,** or **$z Yobe River Watershed**	5	3.8
Unverified river in heading bearing free-floating word *Valley* but not the word *River*, e.g., **$z San Luis Valley**	5	3.8
River verified in heading bearing free-floating word *Valley* but not the word *River*, e.g., **$z Amazon Valley**	4	3.0
Two place names in one heading, e.g., **$z Hanalei, Kauai,** or **$z Atchison County and Jefferson County**	3	2.3
Word or phrase that is part of previous or next subfield, e.g., **$z Primitive** is part of the main heading, **Sculpture**	2	1.5
Total	132	100.0

LCNAF records have a free-floating phrase. Table 2 summarizes characteristics of these geographic names.

The majority of unverified geographic names (59.1%) are correctly constructed and probably designate a valid place. Examples are listed below preceded by first-order political divisions.

$z Arkansas $z Yellville Region
$z Cuba $z Port au Prince
$z Illinois $z Warsaw
$z Mexico $z Leon Region
$z Papua New Guinea $z Mendi
$z Papua New Guinea $z Sepik District

Several unverified geographic names probably designate a valid place; however, they contain one or more errors connected with direct or indirect subdivision, abbreviation, or punctuation. Most examples listed below are not preceded by first-order political divisions because of direct or indirect subdivision errors.

$z Celles-sur-Belle, France
$z Cinco Villas, Spain
$z Eger, Bohemia
$z Santa Clara, New Mexico
$z Toulepleu, Ivory Coast
$z Vanuatu $z Efate (Island)

A qualifier error pertains to the combination of a geographic name requiring indirect subdivision and the first-order political division preceding it. An example of a qualifier error is the geographic subdivision **$z White Mountains** preceded by the first-order political division **$z New Hampshire** in the assigned subject heading **Birds $z New Hampshire $z White Mountains**. In LCSH-mr, the direct form of the place named in the former subdivision is **White Mountains (N.H. and Me.)**. This geographic feature lies within two jurisdictions, thus, the direct form is used in geographic subdivision. A qualifier error occurs in the trailing geographical subdivision of this assigned subject heading because the intervening first-order political division contains only one of the two geographic elements.

Several (5.3%) unverified geographic subdivisions name large regions, e.g., **$z Minnesota, West Central** and **$z Minnesota, Central**. About 10% of unverified geographic subdivisions refer to rivers and valleys.

UNAUTHORIZED GEOGRAPHIC SUBDIVISIONS

Geographic names that are not verified through the names in machine-readable authority records are not necessarily unauthorized. For example, the first-order political division in the string **$z Cuba $z Port au Prince** is probably unauthorized and should be replaced with **$z Haiti**. However, without further authority work to determine whether such a place also exists in Cuba, the project team placed the first element of the string in an authorized heading category in Table 1 because a machine-readable authority record exists in LCSH-mr for this first-order political division.

Table 3 lists categories for the few geographic subdivisions that are considered unauthorized. Several subdivisions name entities that should be extracted from the subdivided heading and made into a

TABLE 3

UNAUTHORIZED GEOGRAPHIC SUBDIVISIONS

Notes about These Unauthorized Geographic Names	No.	%
Unauthorized with preceding elements of the string, e.g., **$z California** when preceded by **$z United States**	21	72.4
Probably corporate name, e.g., **$z Tufts University**	5	17.2
Geographic subdivision preceded by two other geographic subdivisions	2	6.9
Obsolete geographic name traced in note field 667 only	1	3.5
Total	29	100.0

corporate name. An example is the trailing geographic subdivision in the assigned subject heading **Computer-assisted instruction $z United States Naval Academy**.

Most (72.4%) unauthorized geographic names are unauthorized with the preceding elements of the string. For example, the second geographic subdivision in the assigned subject heading, **Birds $z Soviet Union $z Umanskiy uyezd, Ukraine** is unauthorized with the element immediately preceding it. This heading can be corrected in one of two ways: the last subdivision could be deleted, or the first subdivision could be replaced by the **Ukraine** element in the second subdivision. Because the Michigan project team reviewed subdivided strings from left to right, they placed the last element of the string in an unauthorized category. Similar to this unauthorized category is the category for geographic subdivisions preceded by two other geographic subdivisions. An example is the last geographic subdivision in the assigned subject heading **Watershed management $z Kansas $z Atchison County and Jefferson County $z Coal Creek Watershed**.

One geographic subdivision is unauthorized because it names an obsolete place that is traced in MARC note field 667. The subdivision is **$z Ireland (Eire)**. This obsolete form is traced in MARC note field 667 in the name authority record for **Ireland**.

ERRONEOUS GEOGRAPHIC SUBDIVISIONS

Figure 3 summarizes the percentages of geographic subdivisions with and without errors.

Only 3.4% of topical subdivisions and 7.7% of period subdivisions contain one or two errors.[23] A total of 12.3% of geographic subdivisions contains errors. Some subdivisions have as many as three errors. Table 4 gives categories of errors in geographic subdivisions.

Indirect subdivision errors constitute the largest percentage of errors (18.5%). Subdivisions with this type of error do not have a geographic subdivision for a first-order political division interposed between the subject heading and the name of the subordinate political, administrative, or geographic division. Examples are the geographic subdivisions in the following assigned subject headings:

Agriculture $z Guilford County (N.C.)
Archaeology and history $z Williamsburg (Va.)

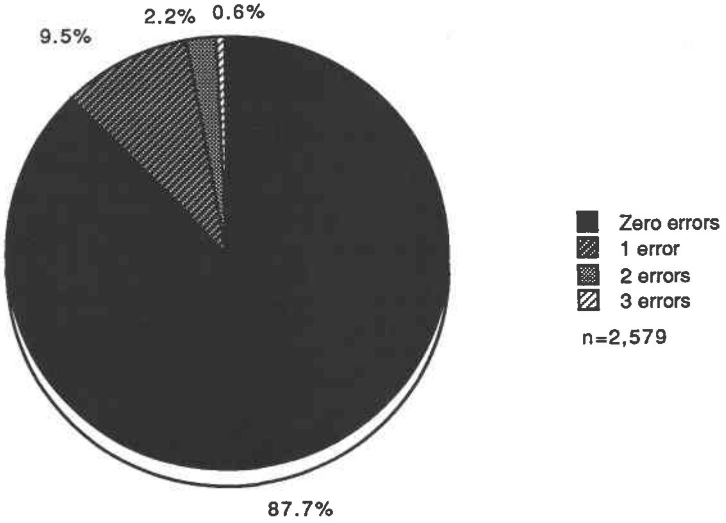

Figure 3. Errors in Geographic Subdivisions.

TABLE 4

ERRONEOUS GEOGRAPHIC SUBDIVISIONS

Type of Error	No.	%
Indirect subdivision error	75	18.5
Punctuation error	73	18.0
Qualifier error	55	13.6
Direct subdivision error	45	11.1
Incorrect placement of geographic subdivision	45	11.1
Abbreviation error	40	9.9
Incorrect subfield code ($b, $x, or $y instead of $z)	31	7.7
Geographic subdivision appended to main heading that cannot be subdivided geographically	23	5.7
Addition/omission of one character	5	1.2
Substitution/transposition of one character	4	1.0
Missing one word	4	1.0
Incorrect free-floating phrase	3	0.7
See reference in *LCSH*	2	0.5
Total	405	100.0

Hotlines (Counseling) $z Westchester County (N.Y.)
Names, Geographical $z Grand Forks County (N.D.)
Traffic surveys $z Erie (Pa.)

The geographic subdivisions in the examples above are direct forms of geographic names. In their present form, they could be used as main headings for geographic names. When punctuation in direct forms deviates from prescribed punctuation, the project team recorded a punctuation error. The following assigned subject headings are examples of headings with punctuation errors. They also contain indirect subdivision errors.

Migration, Internal $z Columbus, Ohio
Roads $x Economic aspects $z Everett, Wash.
Socially handicapped children $x Education $z Sacramento, Calif.
Water mills $z Stillwater, N.J.

When the abbreviation in indirect or direct forms deviates from authorized abbreviations, the researchers recorded an abbreviation error. Almost 10% of errors in geographic subdivisions are abbreviation errors. Example 2 lists some assigned subject headings that have one or more errors for indirect subdivision, punctuation, and abbreviation.

Of errors in geographic subdivisions, 13.6% are qualifier errors. The researchers encountered several different types of qualifier errors: missing qualifiers, superfluous qualifiers, one word present in the qualifier of the authorized geographic name that is not present in the qualifier of

Assigned Heading	*Errors*	*Correction*
Housing $z Louisiana $z St. Tammany Parish	(3)	**Saint**
Real property $z Orange Co., Florida	(1–3)	**$z Florida $z Orange County**
Registers of births, etc. $z Bradley Co., Tenn.	(1–3)	**$z Tennessee $z Bradley County**
Sand $z Illinois $z Macon Co.	(3)	**County**

Example 2. Errors in Assigned Subject Headings.

the geographic subdivision, and one word absent in the qualifier of the authorized geographic name that is present in the qualifier of the geographic subdivision. For geographic subdivisions in Germany, there were frequent instances of the last two qualifier errors. The words *East* or *West* were used in the assigned subject heading but not in the authorized geographic name, and vice versa. Due to multiple changes in subject cataloging practice concerning Germany since World War II, it is not surprising to find many errors in these headings.

Direct errors account for 11.1% of errors in geographic subdivisions. The project team considered the following situations direct errors:

- a geographic subdivision for a first-order political division is missing between the subject heading and the name of the subordinate political, administrative, or geographic division;
- the geographic subdivision does not qualify as first-order political division; or
- the indirect subdivision and separate subfield codes for geographic subdivisions are reversed.

Examples of subject headings with direct errors are given in example 3.

Incorrect placement of geographic subdivisions accounts for 11.1% of errors. An example is the assigned subject heading **School buildings $x Heating and ventilation $z Washington (State) $z Carson**. According to current policy, the two geographic subdivisions should precede the topical subdivision. Online system software could determine the optimal location of the optional geographic subdivision using the Direct/Indirect Subdivision Code.[24] For example, the assigned topical subject heading **650 School buildings $x Heating and ventilation $z Washington (State) $z Carson** would not be validated by the topical subject **150 School buildings [$z optional geographic subdivision] $x Heating and ventilation** because of the erroneous placement of the geographic subdivisions.

Online system software could also use information about the optimal position of geographic subdivisions to detect and delete subdivisions under subject headings that should not be subdivided geographically. Of the errors in geographic subdivisions, 5.7% are connected with such subject headings. For example, the absence of the optional geographic subdivision code in the authority record for the topical heading **150 Business** indicates that no geographic subdivisions should be appended to it. Thus, online systems could use the authority record to automatically delete the geographic subdivision in the assigned topical subject heading **650 Business $z Portland Metropolitan Area (Or.) $x Periodicals**.

Spelling errors account for 2.2% of errors. A few geographic subdivisions are missing one word (1.0%) or enlist an incorrect free-floating phrase (0.7%).

NEED FOR INDIRECT FORMS OF GEOGRAPHIC NAMES

Subdivisions for geographic names are more likely to occur with topical subject headings (52.4%) than with subject headings for geographic names (3.1%) (see figure 1). Of the 2,579 geographic subdivisions appended to topical subject headings, 93.7% can be verified through authority records for geographic names (MARC tag 151) in LCSH-mr or LCNAF. Most places named in geographic subdivisions are first-order political divisions. Such places do not require indirect subdivision. Examples are **Europe**, **Michigan**, and **Sri Lanka**. About one quarter of geo-

Assigned Heading	*Errors*	*Correction*
Agriculture $z Oxfordshire $z Otmoor	(2)	reconstruct heading
Cathedrals $z Alsace $z Strasbourg	(2)	reconstruct heading
Porcelain $z Baden-Baden	(1)	**$z Germany $z Baden-Baden**
Water quality $z Farmington $z Connecticut	(3)	transpose subdivisions

Example 3. Errors in Geographic Subdivisions.

graphic subdivisions requires indirect subdivision (see table 1). To assist catalogers in indirect geographic subdivision assignment and to pave the way for automatic system validation, cross-references for indirect forms are needed. Specific recommendations and discussion of enhancements for machine-readable authority records follow.

1. *Make cross-references for indirect subdivision available in LCSH-mr and LCNAF records.*

The presence of cross-references for the indirect form of geographic names in LCSH-mr or LCNAF records would help catalogers and catalog maintenance staff assign and verify geographic names in subdivisions. In addition, cross-references would indicate to catalogers that they are working with subordinate political divisions requiring indirect subdivision. Catalogers could "cut" indirect forms from authority records and "paste" them into the bibliographic records they are creating. The authority records for places in exception countries would also contain indirect forms to save staff from consulting the *Anglo-American Cataloguing Rules*, second edition (*AACR2*), *LC Rule Interpretations*, and *SCM:SH*.

Using manual methods of enhancing existing authority records with indirect forms could make this process unduly lengthy and costly in terms of the personnel and online resources needed to finish the job. Before initiating a project to add indirect forms to existing authority records, the library community should investigate the feasibility of using an expert system to formulate indirect forms automatically.

A second, perhaps even more important, benefit of adding cross-references for indirect subdivision in LCSH-mr and LCNAF records is to assist online systems in automatic validation of assigned subject headings. The availability of cross-references for indirect forms of geographic names would reduce errors in geographic subdivisions because online system software can automatically detect and correct some errors and flag other errors for review by an intermediary. For example, to detect direct or indirect subdivision errors, an online system would look for the first occurrence of a geographic subdivision in a subject heading string. It would search the file of name authority and/or subject authority records for the direct form and any indirect form cross-reference. If the indirect form exists but the geographic subdivision matches the direct form, the subject heading contains a direct error that must be corrected. To correct the error, the system would substitute the indirect form in the authority record for the direct form in the subject heading. If the indirect form does not exist, the system would take the second occurrence of a geographic subdivision in the subject heading string and search the file of name authority and/or subject authority records to verify that the cross-reference for the indirect form is the combination of the two geographic subdivisions in the assigned subject heading.

Other errors in geographic subdivisions that systems can automatically detect and correct are punctuation errors; some qualifier errors, i.e., superfluous qualifiers or missing qualifiers; incorrect placement of geographic subdivisions; geographic subdivisions in subject headings that cannot be subdivided geographically; incorrect subfield codes; and *see* references in LCSH-mr and LCNAF. These errors and direct and indirect errors may be as many as three-quarters of the errors in geographic subdivisions (see table 4). Online systems may flag some errors for correction by catalogers or catalog maintenance staff. Systems will also need assistance to correct the following errors: other qualifier errors, abbreviation errors, and typographical errors. Online systems can detect a few categories of unauthorized subdivisions. Examples are: successive occurrences of three or more geographic subdivisions in a single string; corporate bodies used as geographic subdivisions, e.g., subfields given code $b; and geographic subdivisions that are unauthorized with the preceding elements of the string, e.g., **$z California** when preceded by **$z United States**.

2. *Use an initial phrase, such as "SUBJECT USAGE," consistently in Nonpublic General Note fields (MARC tag 667) of name authority records.*

Field 667 sometimes contains information to instruct catalogers to trace a name in a subdivision differently from the form in the authorized heading. The consistent presence of the phrase "SUBJECT USAGE" would enable online systems to alert catalogers to Nonpublic General Notes that trace a different name for subject subdivision assignment or contain instructions about formulating such names. A review of the contents of such fields may be necessary because they occur in frequently-used records, e.g., **Germany**, **Great Britain**, and **United States**. Catalogers could become indifferent to the system's alert because it would appear so often.

3. *Explicitly code the Direct/Indirect Geographic Subdivision Code in machine-readable authority records for topical subdivisions.*

Indirect geographic subdivision is sometimes authorized by free-floating topical subdivisions appended to main subject headings for names and topical subjects. The presence of explicit coding in such records authorizing geographic subdivision would enable systems to automatically validate the use of indirect geographic subdivision.

CONCLUSION

The data and analyses in this paper demonstrate the potential of online systems to assist in the assignment and validation of indirect geographic subdivision in assigned subject headings. Almost 70% of geographic subdivisions appended to topical subject headings are for first-order political divisions that require no changes to the forms used in LCSH-mr and LCNAF records. Catalogers could "cut" direct forms from existing authority records and "paste" them into the subject headings they are creating. Online systems, however, could not automatically validate first-order geographic names until authority records contain cross-references or some other designation to enable online systems to distinguish first-order political divisions from names requiring indirect subdivision.

About 23% of geographic subdivisions appended to topical subject headings require indirect geographic subdivision. The availability of cross-reference fields containing the indirect form of name would enable catalogers to "cut" and "paste" such forms into the subject headings they are formulating and would allow online systems to validate indirect geographic subdivision.

At the same time online systems are programmed to replace fill characters in LCSH-mr records with a code that designates whether the heading can be subdivided geographically, they can be programmed to determine the optimal location for the optional geographic subdivision. Systems could act on their own to rearrange the order of subdivisions and to delete unauthorized use of geographic subdivision. Online systems can detect and automatically correct several other errors in geographic subdivision, e.g., punctuation errors, missing qualifiers, and incorrect subfield codes. They must call on human intermediaries to assist with some errors, e.g., abbreviations and typographical errors.

The fifth recommendation of the LC Subject Subdivisions Conference supported the Library's current policy of indirect subdivision.[25] It also suggested that LC investigate including the indirect form of geographic names in authority records. The inclusion of indirect forms would substantially increase the potential of online systems to assist in the assignment and verification of the places named in subject subdivisions.

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Time and Workflow Study of the Cataloging Process Used to Evaluate Library of Congress Cardsets as a Cataloging Support Service

Claudine Arnold Jenda

The objective of this study was to determine the extent to which Library of Congress catalog cardsets facilitate the cataloging and classification processes. This case study was conducted during the period 1985 to 1987 at the University of Botswana library, where because of the cost of the subscription to the Blackwell North America card service, the usefulness of the card service needed to be justified. Time studies of the cataloging and classification processes were performed and the data analyzed. In addition, workflows of the cataloging and classification processes were ascertained. Carefully monitored cataloging statistics collected over an eight-month period were also analyzed for additional information. From the results of the time study, an estimate of the cataloging costs incurred when cataloging a title with cardsets has also been worked out and compared to the cost for original cataloging.

As computerized library systems become more prevalent and sophisticated, an increasingly large number of libraries are using cataloging support services of one form or another in the creation of their local catalog records.[1] Saffady enumerated the existing cataloging support services to include online systems from commercial database vendors, such as DIALOG, that make available Library of Congress (LC) MARC tapes such as *Bibliofile*, and online databases of cooperative library networks that contain tape-loaded LC MARC records as well as catalog records in MARC format originating from members of the network.[2] Overall, LC remains the main consistent source of high-quality cataloging in machine-readable form, such as MARC tapes that are purchased by commercial vendors, libraries, or library networks and made available online, in printed catalog cardsets, and lately on CD-ROM.

For libraries in less industrialized nations, such as Botswana, the choice of a cataloging support service is still very limited, despite the wide range of services available universally. LC cardsets are still

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the preferred choice for such libraries because the cost of online services is generally prohibitive, as is the high initial capital cost of CD-ROM products; the general lack of appropriate local technical support for such systems given the remoteness of most of the suppliers of computer-based cataloging support services is also a factor.

The lack of options in cataloging support services for libraries in less industrialized nations results from the fact that most such libraries are still not computerized because of inadequate library funding. For those libraries that do consider computerizing their services, the lack of personnel with expertise to implement and oversee an automation project and the cost of training may be additional impediments. Also, importing computer technology to most less industrialized nations is much more costly, requiring much higher capital costs compared to the cost of the same computer system on the market in a developed nation.

There are three main reasons for such high costs. First, in developing nations, purchasing of computer systems is done through a third party, usually a local firm that is licensed to sell given equipment by the original manufacturer. This lack of direct dealer price and support inflates costs. Second, the currencies of most developing nations are much weaker than the currencies of the countries in which computer systems are manufactured. A purchase in a foreign currency requires more of a developing nation's weaker currency and translates into a significantly higher purchase price. Finally, in most developing nations, computer equipment is subjected to import tax. This inflates the original price even further and it also inflates maintenance costs, most of which involve importing parts.

The results of this study were meant to give an objective assessment of the usefulness of the card service. Data on the amount of time required to catalog an item in the present manual cataloging environment are also provided. A study of cataloging workflow was used to identify the rate-determining steps in the cataloging process that might need reviewing or monitoring to improve the process. Estimates of the cataloging cost per title for items with and without cardsets are also presented. Time measures of the present manual cataloging process could also be used as a base for comparison of an acceptable computer-based cataloging system when the library later decides to computerize its functions and services.

BACKGROUND

The University of Botswana Library started in 1970, after the breakup of the University of Botswana, Lesotho, and Swaziland (UBLS) system, the main campus of which was based at Roma in Lesotho. The library has about 250,000 titles, about thirteen professional librarians, about ten paraprofessional librarians (with diplomas or certificates in librarianship), and about forty support staff. Figure 1 shows the library's organization chart. The cataloging coordinator and the subject librarians with their assistants are the staff involved in the cataloging process. Subject librarians are responsible to the three coordinators: acquisitions coordinator, cataloging coordinator, and reader services coordinator for collection development, cataloging and classifying, and reference and information services, respectively. The library has defined four broad subject area divisions to which subject librarians are assigned: humanities, sciences, social sciences, and education.

PROBLEM

The library started with an initial collection of about 600 donated books, three professional librarians, and a very small support staff. However, the late 1970s to 1980s have been periods of rapid growth for the University of Botswana, in terms of enrollments, programs introduced, and funding, as befits a growing university. From such modest beginnings, the University of Botswana Library is presently one of the fastest growing libraries in Botswana, especially in terms of collection development, as it attempts to acquire both current and retrospective materials to support the growing teaching and research needs of the university. Not all of the library's

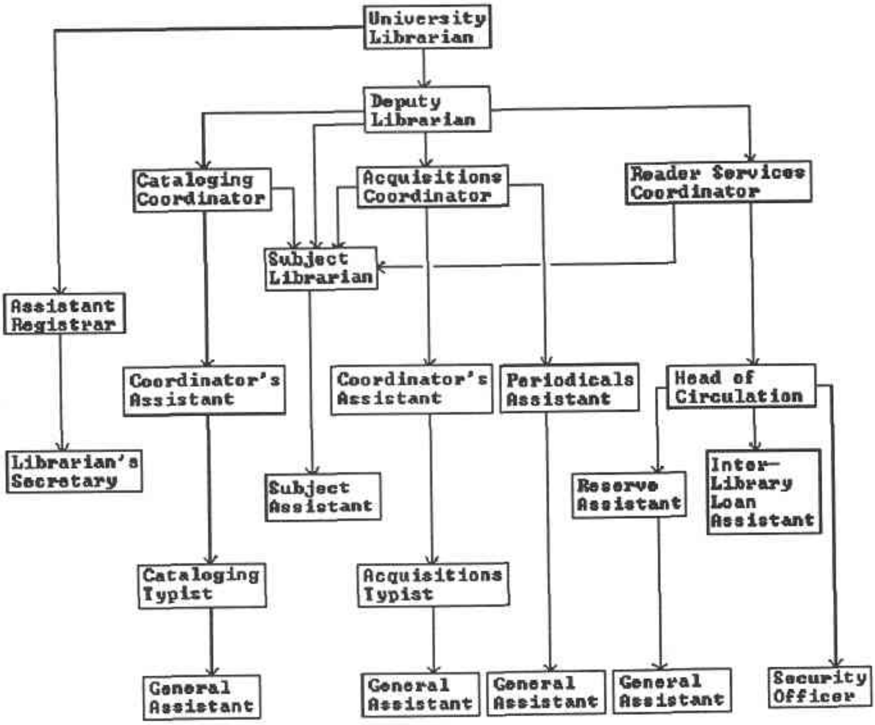

Figure 1. University of Botswana Library Organization Chart.

services have kept up with this increased rate of acquisitions. The cataloging section, for example, since the early 1980s has been faced with a persistent problem of unacceptable delays in processing. Such delays create cataloging backlogs. Like most library procedures, cataloging procedures are generally long, repetitive, and tedious such that delays and backlogs are expected. However, there was a need to address the processing delays and cataloging backlog problems because:

1. A similar slowing down in processing started affecting the other technical services of the library, such as the acquisitions section, partly because of space problems. A slowing down in processing in acquisitions meant that the library could not tell which of the ordered titles had arrived in the library. This delay, in turn, started slowing down the claiming process and generally made accounting and planning the library's budget difficult.
2. Another serious implication of delays in processing at the cataloging stage was that books and other library material that faculty and other library users had requested for their research and teaching had arrived in the library, but were unavailable to them, a problem made worse by the limited shelf space in the old library building.

Overall, the processing delays and cataloging backlog problems had the potential to adversely affect the quality of the library service and destroy the library's public relations.

The library decided to subscribe to the Blackwell North America (BNA) card service to help facilitate the cataloging process. This involved the library setting up a profile through the library's book order agents that describes the cataloging details required, including the access points considered suitable for the needs of the library. The profile is used to generate catalog cardsets automatically from the LC MARC database for all items purchased through the library's agents.

The cost of the card service in the local currency, Pula, has been estimated to be at least P0.70 per title per cardset. The expected annual expense is between P20,000 and P30,000. Because the library purchases most of its books, serials, and other library materials from Europe and North America, payment for the card service involves use of foreign exchange. During the study period one Pula was equivalent to $0.60 U.S. and to £0.30 British. This makes the actual cost of the card service unpredictable given the fluctuating exchange rates of the currencies involved. And given the much lower purchasing power of the local currency than the British pound and U.S. dollar, two of the major currencies in which the library has dealings, the actual annual cost of the card service ends up being much higher than expected. Because subscription to the card service represented a standing commitment of funds on the part of the library, there was a need to give an objective assessment of the usefulness of the card service.

PREVIOUS WORK

There are several studies of copy cataloging in the library literature. For example, Kohl's work is a collection of several research studies on library issues including cataloging and use of cataloging support services, such as the OCLC Online Computer Library Center, Inc., and cardsets.[3] More recent literature on the subject is generally lacking. Since much of the available literature reports case-study type research, it was questionable how applicable results would be to the University of Botswana Library situation. In the literature, several institutional differences arise that make comparisons of research findings difficult.

DIFFERENCES IN CATALOGING PROCEDURES

Despite the increasing standardization of practices employed in technical services, most resulting from cooperative cataloging efforts, the cataloging procedures that a library employs are influenced by a library's local conditions, standards, and pressures such as level and quality of library staffing, type and size of library users served, size of the collection, processing priorities, level of detail in cataloging, and participation in shared cataloging efforts. Such factors interact and result in local cataloging policies and procedures that are often unique to a given library, making direct comparisons of data difficult.

LACK OF STANDARDIZED STUDY METHODS

There are no standardized methods for studying technical services, which makes comparisons and attempts to reproduce reported results difficult. Most studies report cost studies of the cataloging process. Note that such cost studies generally introduce additional variables, e.g., salaries and benefits, that vary from one institution to another. For our purposes, again because of the fluctuating foreign currency exchange rates involved in the purchase of cardsets, cost data would be unpredictable. A time and workflow study of the cataloging process is preferred and emphasized over a direct cost study to ensure a wider applicability of the research findings and to minimize the differences just discussed.

METHODS AND FINDINGS

Accessioned library materials from acquisitions that required cataloging were routinely distributed to subject librarians by subject. Because each subject librarian is responsible for a selected number of subject areas, library materials were made available to them to catalog according to their respective subject areas. All formats normally carried by the library were made available to subject librarians for cataloging.

TABLE 1

SUMMARY OF CATALOGING STATISTICS COLLECTED OVER AN EIGHT-MONTH PERIOD

	Books with Cardsets					
Subject Librarian	Copy Cat. (No.)	Class Changes (No.)	Rejected Cardsets (No.)	Total Original Cat. (No.)	Total Books with Cardsets (No.)	Total Books Cat. (No.)
1	600	17	12	259	629	888
2	315	71	0	258	386	644
3	1,485	101	95	963	1,681	2,644
4	208	18	1	85	227	312
5	112	8	2	176	122	298
6	645	1	3	131	649	780
7	204	5	0	48	209	257
Totals	3,569	221	113	1,920	3,903	5,823
Percent	61%	4%	2%	33%	67%	100%

These included monographs, serials, nonprint materials, and maps. Subject librarians working on their own regular schedules would, from time to time, catalog materials from their set of uncataloged materials from acquisitions. Weekly cataloging statistics were collected by subject librarians showing the types and quantity of materials they had cataloged and which of those materials were supplied with cardsets. Cataloging statistics for the various subject areas, collected over an eight-month study period, were assessed to determine the overall proportion of materials that are supplied with cardsets. Of these, the proportion of cardsets that were acceptable, required changes, or were rejected were also determined.

From such statistics, we would have an indication of the quality of LC cardsets and how suitable they were to the library. A description of the present cataloging procedure is also given. Cataloging flowcharts were drawn and used to determine the workflow. The time it takes to complete each cataloging task was measured and then the total cataloging time for an item with a cardset was compared with the time required for original cataloging.

AN ASSESSMENT OF THE QUALITY OF THE CARDSETS

A cataloging statistics form was designed and used by all subject librarians who catalog and classify all library materials. The form showed for each subject the total number of books, serials, and nonprint materials cataloged and classified and of these, the number that had cardsets. Statistics were collected over an eight-month period that was considered representative of the regular working cycle that the library undergoes in a year.

For four months during the study period, library staff were involved in moving the collection from an the old library to a new library building. Although most academic support activities of the library remained continuous, the intensity and rhythm of liaison, collection development, and cataloging were altered considerably by the move. Cataloging statistics from this period are not used in this study because they were not representative of the library's normal working patterns. Table 1 shows the resulting cataloging statistics. Because the profile used to generate cardsets excludes serials, and nonbook and nonprint formats, the observed statistics on cardsets apply largely to books. The total number for original cataloging includes serials and nonprint formats, which made up 12% of the total sample. From the observed statistics, 67% of the books purchased are supplied with cardsets. This finding is comparable to the results Hudson found where an average of 73% of records for the twenty-five libraries surveyed had LC copy.[4]

DESCRIPTION OF PRESENT CATALOGING PROCEDURES

Procedures that are presently used for cataloging books in the library were studied, and a flowchart of the various cataloging tasks drawn. This was done to identify the rate-determining steps in the cataloging process.

Flowcharts of the cataloging procedures for books were drawn and used to ascertain the cataloging workflow. The staff involved in the cataloging process are the cataloging coordinator, subject librarians, the cataloging coordinator's assistant, the subject librarian's assistants, and the cataloging typists (see figure 1). Figures 2a–2d show the resulting cataloging flowcharts. The various components of the cataloging process have been subdivided such that any subject analysis of material being cataloged (see figure 2b) is performed by subject librarians, who also perform reference duties, collection development, bibliographic instruction, and liaison with faculty for their assigned subject areas. The other professional staff member involved in the cataloging process is the cataloging coordinator, who oversees the overall cataloging process, performs quality checks of the cataloging that subject librarians produce, and ensures that the catalog resulting from all the cataloging of the various librarians is an accurate, consistent, and effective retrieval tool for accessing the library's collection (see figure 2c). Assistants to the subject librarians and cataloging coordinator perform the remaining clerical components of the cataloging process (see figures 2a and 2d, respectively).

CATALOGING BACKLOGS

Throughout the year, the cataloging section has an accumulation of books awaiting processing at various stages. Closer observation shows that the section is behind in processing at mostly three stages (1 to 3):

1. *Books awaiting descriptive cataloging.* Subject assistants do the descriptive cataloging of all newly arriving books in a given subject area. For books with cardsets, the cataloging on the cardsets is checked for accuracy and adherence to *Anglo-American Cataloguing Rules*, second edition (*AACR2*). This is usually the first stage of the delay in the process. As a first stage in the cataloging process, some holdup of books should be expected, as may be the case when more books are sent in from the acquisitions department than can be cataloged in a given time. However, the number of books awaiting processing should not accumulate over extended periods.
2. *Books awaiting classification.* Several books await processing at this stage. The actual numbers vary with subject area. Over the years, delays at this stage have caused the most concern. Hiring more subject librarians would solve the backlog problem at this stage. However, this would necessitate establishing additional professional positions in the library, a process that is usually slow, and with the scarce professional staff available positions take a long time to fill. Hiring more subject librarians is possibly a costly solution.
3. *Books awaiting typing.* Several books again get delayed at this stage. This possibly constitutes the rate-determining step of the whole cataloging process. For most of the year, only one typist is available to do all of the typing in the cataloging section. One typist normally cannot process all the weekly cataloging output of about eight subject librarians. Because of the shortage of staff at this stage, books await processing for a minimum of one

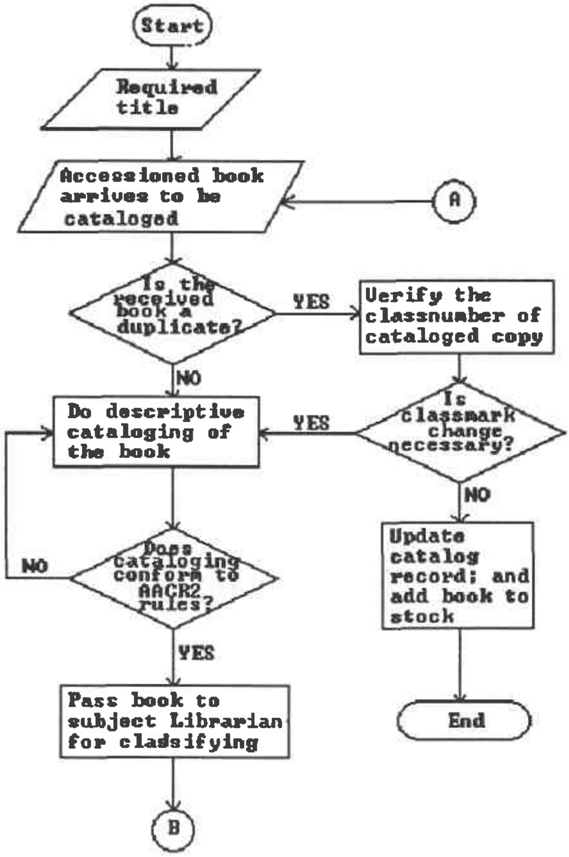
Start
Required title
Accessioned book arrives to be cataloged
A
Is the received book a duplicate?
YES
Verify the classnumber of cataloged copy
NO
Do descriptive cataloging of the book
YES
Is classmark change necessary?
NO
Update catalog record; and add book to stock
NO
Does cataloging conform to AACR2 rules?
YES
Pass book to subject Librarian for cladsifying
End
B

Figure 2a. Descriptive Cataloging Stage.

month and a maximum of six months or longer.

Another potential bottleneck in the process, though not critical yet, is the cataloging coordinator's stage. Books that the eight subject librarians have cataloged and classified over the week are submitted to the coordinator at the beginning of the following week. By procedural design, the cataloging coordinator is always at least one week behind in processing. Expecting the one coordinator to check thoroughly the weekly cataloging output of eight librarians in a one-week period is unrealistic.

Hiring more typists would be the obvious solution to improving the cataloging process. Note, however, that clerical staff with typing skills are a scarce resource at the University of Botswana. The university cannot attract and retain typists as well as competing institutions in the industry, which often offer clerical staff with typing skills far better salaries and terms. The high staff turnover at this position often leaves a shortage of staffing that slows the cataloging process. The notion that less industrialized nations are a good source of unskilled labor as opposed to professional staff does not necessarily benefit an academic library. For example, hiring more subject assistants would solve the problem of backlogs at the descriptive cataloging stage. However, the educational requirements for subject assistants—high school diploma with a certificate or diploma in librarianship—excludes a large proportion

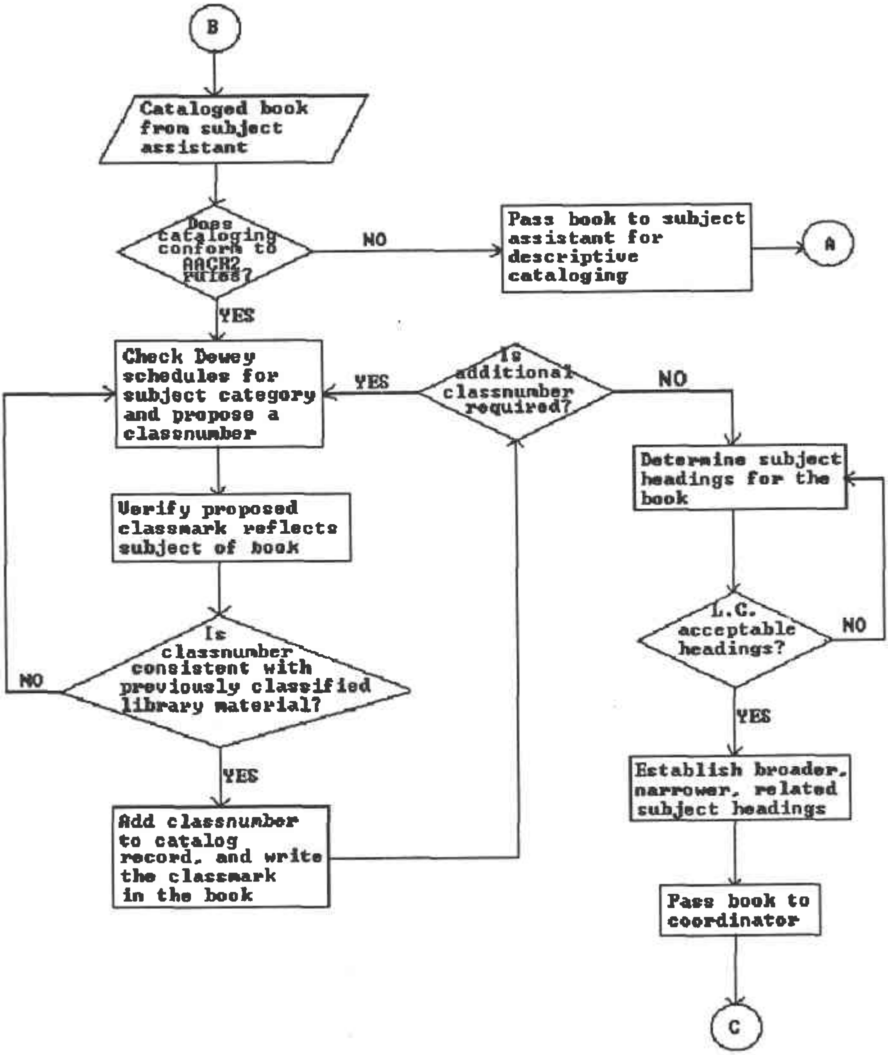
B
Cataloged book from subject assistant
Does cataloging conform to AACR2 rules?
NO
Pass book to subject assistant for descriptive cataloging
A
YES
Check Dewey schedules for subject category and propose a classnumber
YES
Is additional classnumber required?
NO
Determine subject headings for the book
Verify proposed classmark reflects subject of book
Is classnumber consistent with previously classified library material?
NO
L.C. acceptable headings?
NO
YES
YES
Establish broader, narrower, related subject headings
Add classnumber to catalog record, and write the classmark in the book
Pass book to coordinator
C

Figure 2b. Classifying and Indexing Stage of Cataloging Procedure.

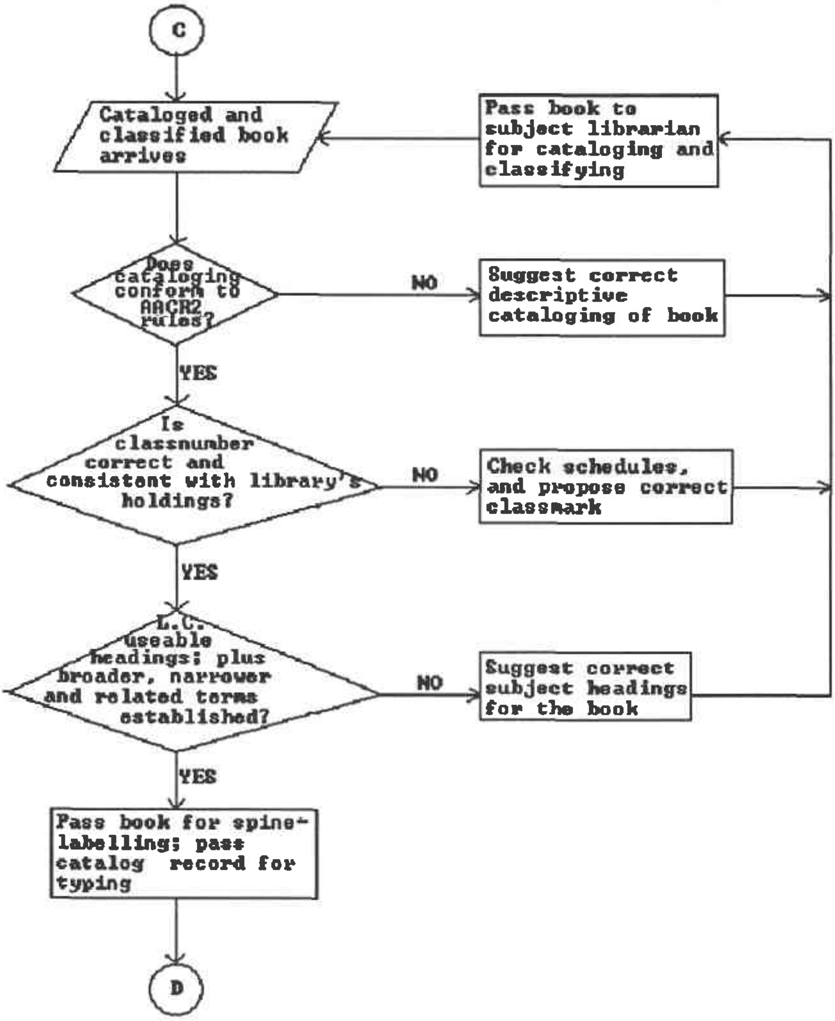
C
Cataloged and classified book arrives
Pass book to subject librarian for cataloging and classifying
Does cataloging conform to AACR2 rules?
NO
Suggest correct descriptive cataloging of book
YES
Is classnumber correct and consistent with library's holdings?
NO
Check schedules, and propose correct classmark
YES
L.C. useable headings; plus broader, narrower and related terms established?
NO
Suggest correct subject headings for the book
YES
Pass book for spine-labelling; pass catalog record for typing
D

Figure 2c. Cataloging/Classification Consistency Checking Stage of the Cataloging Procedure.

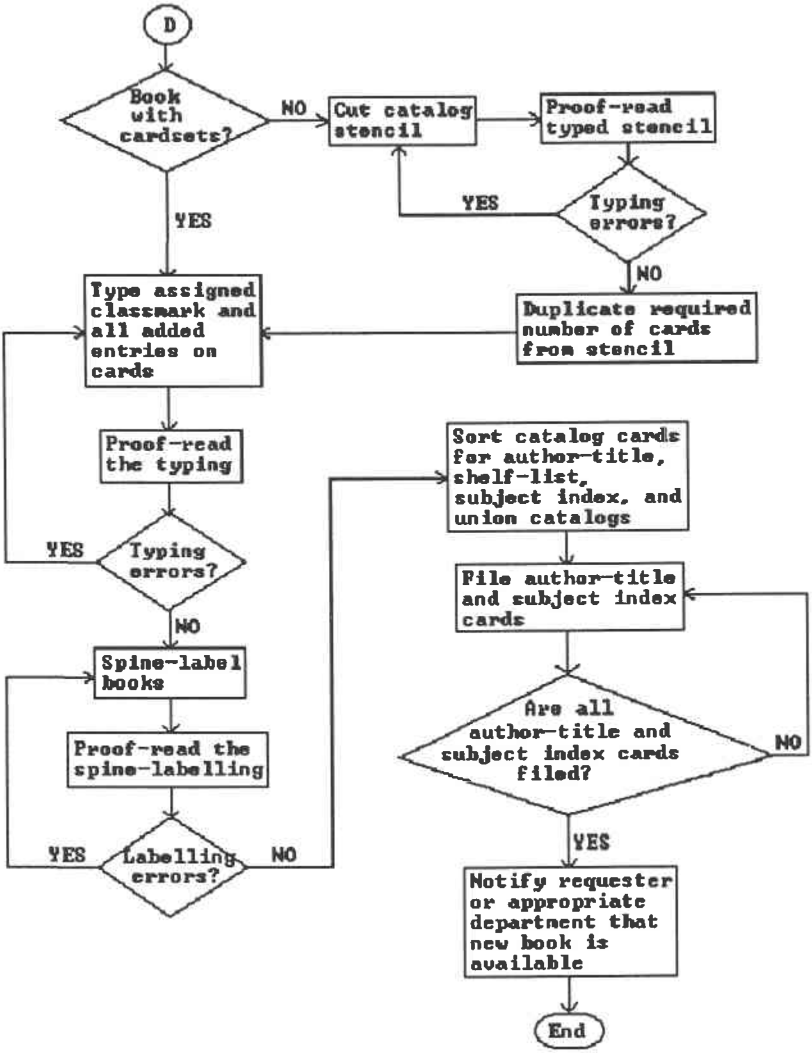
D
Book with cardsets?
NO
YES
Cut catalog stencil
Proof-read typed stencil
Typing errors?
YES
NO
Duplicate required number of cards from stencil
Type assigned classmark and all added entries on cards
Proof-read the typing
Typing errors?
YES
NO
Spine-label books
Proof-read the spine-labelling
Labelling errors?
YES
NO
Sort catalog cards for author-title, shelf-list, subject index, and union catalogs
File author-title and subject index cards
Are all author-title and subject index cards filed?
NO
YES
Notify requester or appropriate department that new book is available
End

Figure 2d. Catalog Cards Typing and the Book Spine-Labeling Stages of the Cataloging Process.

of possible candidates, especially when the fact that most developing nations also have high illiteracy rates is considered. Increasing manpower levels at both clerical and professional levels to improve the cataloging process is not a workable solution at the University of Botswana. This leaves the subscription to the card service as one viable option; if effective in solving the problem, this solution would be justifiable.

PROCESSING TIMES FOR THE VARIOUS CATALOGING TASKS

The time it takes to perform each one of the cataloging tasks identified above was measured. The overall cataloging time required to process a book that has cardsets was obtained and compared to the cataloging time when an item has to be originally cataloged.

Two sets of samples of books to be cataloged were collected: one set all with cardsets and another set without LC cards. The time taken by subject assistants to do descriptive cataloging of the two sets of samples was measured. Ten books were used per sample for subject assistants. Then the sets of cataloged samples for a given subject area were passed on to the appropriate subject librarian. The number of books from a given sample that subject librarians could classify in one hour was determined. In the end, a measure of the time required to process a title was obtained.

The time taken for the whole cataloging process was progressively measured: the time at the cataloging coordinator for consistency checks; the time at the cataloging typist for cutting the catalog stencil and typing classmarks, subject headings, and other added entries; and the time taken to have the samples' spines labeled.

The samples for this exercise were collected from the books that are routinely distributed to subject librarians and the subject assistant they work with. The books in the samples covered the various subject areas that the librarian is responsible for. For the purposes of this exercise, the samples were standardized for level of difficulty. Books that were likely to involve some lengthy complicated cataloging were excluded from the samples. Samples mostly consisted of books rather than serials and other nonbook materials. Timing of the tasks was done in "stop clock" fashion, with the subjects indicating the starting and ending times of an activity. To ensure accuracy of the time measured, subjects involved in this exercise could not engage in any other library activity once they started performing a given cataloging task. Table 2 shows the time required to perform each cataloging task.

When the observed cataloging times are grouped according to the level of staff performing the task, the results shown in table 3 are obtained.

It is interesting to note (see table 2) that tasks requiring the most cataloging time, such as descriptive cataloging, classification, and typing, correspond to the stages that were earlier observed as bottlenecks in the cataloging process. It is also noteworthy that when material being cataloged has no cardsets, the cataloging time by

TABLE 2

PROCESSING TIMES FOR CATALOGING TASKS

	Processing Time per Book			
	With Cardsets		Without Cardsets	
Cataloging Task	Min.	(%)	Min.	(%)
Descriptive cataloging*	4.00	37.3	8.00	41.9
Classification†	3.30	30.8	4.00	20.9
Consistency checking†	1.00	9.3	1.10	5.8
Typing catalog stencil*	0.00	0.0	3.00	15.7
Duplicating stencil*	0.00	0.0	0.60	3.1
Typing headings and entries*	0.91	8.5	0.90	4.7
Spine-labeling*	1.50	14.0	1.50	7.9
Total Processing Time	10.71	99.9‡	19.10	100.0

*Cataloging tasks performed by clerical and general staff.

†Cataloging tasks performed by professional staff.

‡Not equal to 100% due to rounding off.

TABLE 3

TOTAL CATALOGING TIME BY PROFESSIONAL LEVEL

	Processing Time			
	With Cardsets		Without Cardsets	
Staff Level	Min.	(%)	Min.	(%)
Professional staff	4.30	44	5.10	27
Clerical staff	5.41	56	14.00	73
Totals	9.71	100	19.10	100

clerical staff is about three times that needed by professional staff (see table 3). This finding has clear implications for the professional-to-clerical staff proportions needed in cataloging.

COST COMPARISON BETWEEN ORIGINAL CATALOGING AND CARDSETS

In this study, we have emphasized a time study of the cataloging process, rather than costs, to facilitate comparisons with other studies. However, in those instances where monetary measures are required, an estimate of the cataloging costs can be inferred from results of the time study. The need for cost studies arises when library management has to account for decisions it makes regarding products or services (as was the case with this study); when cost-effectiveness becomes a concern; or when there are budgetary constraints, reorganization of library services, or changes in library policies. With the increased use of computer and communications technology in libraries, a choice between alternate types of computer systems may also prompt a cost study.

A sizeable amount of literature exists that deals with cataloging cost studies[5] and cost studies of technical and public service functions.[6-8] However, cost studies of technical and public services lack standardized study methods that can be applied consistently across libraries and still produce meaningful results.

In the literature, two general cost study methods are used: the top-down and bottom-up methods. The top-down method involves keeping track of known expenditures for products or services that the library incurs in a fiscal year to give an overall cost picture. The bottom-up method defines cost data for each component task used in a service, and these data are used to arrive at an overall cost figure.

We will use a combination of these two methods to arrive at an approximate cost of cataloging with cardsets and without cardsets. The amount of time that clerical and professional staff spend performing various cataloging tasks (see table 3) will be used to calculate clerical and professional labor costs below. Except for the capital cost of pieces of equipment, the production costs given in tables 4A and 4B are calculations of the cost to catalog a title.

ASSUMPTIONS

Clerical labor costs assume an annual salary range of between £4,000 to £7,500 for nonprofessional library staff. This gives the range $2,400 to $4,500 per year, assuming an exchange rate of £1.00 to $0.60. The hourly labor costs are based on an average of forty working hours per week, and four weeks per month.

Professional labor costs are based on an approximate salary range of £12,000 to £33,000 for subject librarians.

The price of supplies, such as blank catalog cards or stencils, does not take into consideration volume discounted prices. The capital costs per title assume the equipment listed has an estimated conservative life of 10,000 titles. The cost of cataloging a title when using cardsets is 40% less than the cost per title for original cataloging. Although this cost comparison serves to illustrate the cost saving that cardsets introduce, the values given are not a realistic measure of the cost of the entire cataloging process. This is partly because the average salaries for professional and support staff are used in the calculations instead of the exact salaries for all employees involved in cataloging. More importantly, the cost comparison study did not include the costs of cataloging-related activities that support cataloging, such as writing documentation for cataloging procedures or policies, consulting, or the training that is needed when there are staff turnovers or changes in policies.

The cataloging cost figures given are an accurate reflection of the cost of the actual cataloging tasks performed when there is an item to be cataloged. To obtain cataloging costs that are closer to actual expenditures for the entire cataloging process, the associated costs for all cataloging-related activities would need to be considered as well.

TABLE 4A

COSTS OF IN-HOUSE PRODUCTION OF CATALOG CARDS

One-Time Capital Costs	Price
Mini-Graph Stencil Duplicator	$750.00
Typewriter	235.00
Subtotal	985.00
Estimated capital costs per title	0.10
Production Costs	Price per Title
Clerical labor cost at 0.23 hrs. x $1.8/hr.	0.41
Professional labor at 0.09 hrs. x $7.03/hr.	0.63
Box of 500 mini-graph stencils at $110/box	0.44
Box of 1000 blank catalog cards at $18.50/box	0.20
Ink bottle at $19.50/bottle	0.04
Depreciation costs of stencil duplicator at $0.02/stencil	0.04
Depreciation costs of typewriter at $0.25/hr.	0.02
Estimated production cost per title	1.78
Total in-house cataloging cost per title	1.88

*Two stencils per title.

†Ten catalog cards per title.

‡1,000 stencils per bottle of ink.

TABLE 4B

CATALOGING COSTS USING COMMERCIALLY AVAILABLE CARDSETS

One-time Capital Costs	Price
Typewriter	$235.00
Subtotal	235.00
Estimated capital costs per title	0.02
Production Costs	Price per Title
Cost of cardsets per title	0.42
Clerical labor cost at 0.11hrs. x $1.8/hr.	0.20
Professional labor at 0.07hrs. x $7.03/hr.	0.49
Depreciation costs of typewriter at $0.10/hr.	0.01
Estimated production cost per title	1.12
Total cataloging cost per title using cardsets	1.14

INTERPRETATION OF RESULTS AND DISCUSSION

The total cataloging time for a book with cardsets is about 10.7 minutes, whereas that for a book without cardsets is 19.1 minutes (see table 2). With cardsets, the cataloging process is 1.77 times faster than the time taken for books without cardsets. These findings are consistent with the results of a Cataloging In Publication (CIP) survey of several libraries, where cataloging with copy was estimated to take fifteen minutes or less, and without LC copy, between sixteen to thirty minutes or more.[9]

From table 2, we note that the time saving occurs at the descriptive cataloging stage, where books with cardsets are processed in about half the time it takes to process books without cardsets. The time saving also arises from the omission of two stages in the cataloging process, the typing and duplication of the catalog stencil.

Contrary to expectations, cardsets do not appear to make the classification process much easier or faster. There is no significant difference between the time it takes to classify a book with cardsets, 3.3 minutes, and the time taken for a book without cardsets, 4.0 minutes. Classification is a largely intellectual activity that is not influenced by having a copy to work from. Assessment of a suitable classmark and subject headings that best describe the subject of a book must still take place regardless of whether a classmark is provided by a cardset or not.

On the other hand, any facilitation that the classmark and subject headings on the cardsets may have on the classification process could possibly be nullified by the use of CIP data that most books carry. Taylor and Simpson observed that 49.7% of CIP and 57.8% of LC copy contain accurate cataloging data.[10] When cataloging without cardsets it is plausible that subject librarians could use CIP data for the classification process instead. When comparing the cataloging of given titles, Dowell found that in 68% of a sample of titles in her study, CIP provided cataloging information that was different from the final LC cataloging.[11] Because there has been known to be discrepancies between the cataloging data of CIP and the final LC cataloging, the University of Botswana Library's working policy does not accept use of any other sources of copy other than that supplied on cardsets.

LIMITATIONS OF THIS STUDY

To observe better the effect of cardsets on the classification process, subject librarians who are unfamiliar with the classification scheme or the subject would have to be used as subjects in this study. Similarly, to observe any effect of other available copy, such as CIP data, on the classification process, cataloging times for books with CIP could be compared to those for books without CIP and with those for books supplied with LC cardsets. Because the library in this instance does not use any other sources of CIP and the staff involved in this study did not use CIP in their cataloging, there was no need to devise the study to encompass these objectives. A library that considers all sources of CIP data in its cataloging would be advised to study the effect of CIP on classification and the whole cataloging process also.

There are some added benefits from cardsets at the classification stage that could not be measured in terms of time but deserve mentioning. Subject librarians unanimously agreed that cardsets greatly assisted them in formulating subject headings for books they were classifying. Using cardsets should, therefore, result in greater consistency in the use of terms and result in a catalog that is a better quality retrieval tool in the long run. This is especially important in the case of the University of Botswana Library where a large proportion of professional librarians are expatriates working on short-term contracts.

Note also that time measurements of the cataloging tasks in this study were done in an experimental type of setting where the subjects performed cataloging tasks to the exclusion of all other duties they would normally engage in. In a normal setting, subject librarians and subject assistants perform various other activities, such as collection development, reference and information services, and administrative duties. This method was useful for observing the effect cardsets have on various cataloging tasks and the whole process. The time values obtained are also probably representative of libraries where cataloging is centralized such that the librarian's major activity is cataloging and classifying.

A study that compares the accuracy and overall quality of the cataloging that is supplied on cardsets with that of cataloging produced in-house needs to be done as a follow-up study. In this study, we have been working on the assumption that the cataloging resulting from original cataloging and cardsets is similar. This assumption is based on the fact that the same cataloging rules (*AACR2*), tools, and rule interpretations are used for both. It may be worthwhile, however, to investigate whether these cataloging rules are being consistently applied and adhered to by comparing the quality of cataloging on cardsets and cataloging produced locally.

Overall, results of this study compare well with results of other studies with similar objectives, such as a more recent study by Chandra, who found a mean cataloging time of 28.8 minutes to catalog an item originally.[12] When using OCLC as a source of copy, it took a mean time of 15.2 minutes to catalog an item. Using OCLC as a cataloging support, just like cardsets, makes the cataloging process about two times faster than original cataloging. From the cataloging cost comparison between original cataloging and using cardsets, we see that using cardsets introduces a 40% cost saving in the cataloging process.

CONCLUSIONS

Results of this study show that cardsets do facilitate the cataloging process and, over time, should help eliminate the cataloging backlogs. When using LC cardsets, the cataloging process takes one half the time it takes to originally catalog an item. It is expected that use of MARC-based cataloging support services such as LC MARC should introduce a similar time saving in a computer-based library service employing similar cataloging procedures. The reduction in cataloging time that cardsets introduce represents a 40% saving in cataloging costs. The use of cardsets also results in a more consistent use of subject headings in the main catalog. This is especially important at the University of Botswana Library where there is a high turnover of professional librarians, most of whom serve on short-term contracts. Descriptions of the University of Botswana Library's organization structure and of the current cataloging procedures have also been presented to give a clearer perspective on the context and nature of cataloging problems that were being addressed.

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Enhanced Catalog Access to Fiction: A Preliminary Study

Susan Hayes

The inadequacy of current methods of access to works of fiction in academic and public libraries is discussed. A rationale for providing enhanced catalog access to fiction is presented; the literature on subject-and-genre access to fiction is reviewed. A preliminary study in providing enhanced catalog access to fiction is described and its findings compared with a similar study conducted by the Subject Cataloging Division of the Library of Congress.

BACKGROUND

Access to works of imaginative literature in academic and, especially, public libraries is clearly inadequate in comparison to the detailed access provided for works of nonfiction. In academic libraries, a fictional work of prose or verse is assigned a classification number reflecting its identity as literature of a particular country, depending on its author's nationality. In public libraries, however, most fiction is commonly shelved alphabetically by author's surname, in an arrangement that Clare Beghtol points out is actually classification of a kind, i.e., "classification-by-creator."[1]

Indeed, two of the major instruments for subject access in American libraries, the *Dewey Decimal Classification* (*DDC*) and the *Library of Congress Subject Headings* (*LCSH*), both contain explicit instructions not to provide topical subject access to individual works of fiction, with few exceptions. In *LCSH*, "topical headings are only assigned to biographical fiction, historical fiction, and animal stories."[2] Moreover, as regards historical fiction, "the topical heading is *not* assigned when the event or period is merely the backdrop to the actual story. It is assigned only when the event or period is the principal focus of the work."[3] Similarly, in *DDC*, individual works of literature may be classed according to subject only if they are "redeemed" by sufficient informational content. Noting that, according to Horace, the aims of literature "are twofold: to teach and delight," the Manual to *DDC* goes on to state, "The Dewey Decimal Classification holds to [Horace's] precept. Works of the imagination intended to delight are classed in 800, but works that are essentially informational are classed according to subject in other parts of the schedule."[4] In other words, in *DDC*, topical subject access is accorded a work of fiction only if it resembles a work of nonfiction. Similarly, even though Charles Cutter, in his *Rules for a Dictionary Catalog*, advised catalogers to "Enter WORKS OF FICTION, dramas, poems under subjects which they illustrate,"[5] he immediately

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undercut this recommendation by observing, "Most novels have not enough illustrative value to justify this."[6]

However, if, historically, works that principally "delight" have been accorded fewer access points than those that chiefly "inform," the recent publication of the *Guidelines on Subject Access to Individual Works of Fiction, Drama, Etc.* suggests that some librarians are questioning the adequacy of name-and-title access to individual works of imaginative literature.[7]

RECENT MOVEMENTS TOWARD ENHANCED CATALOG ACCESS

The genesis of the Subject Analysis Committee (SAC) Subcommittee's *Guidelines* occurred in January 1986, with the creation of the Subcommittee on Subject Access to Individual Works of Fiction, Drama, Etc.[8] At that time, the subcommittee was given the following charge:

> To study LC subject headings and other subject heading lists, and recommend changes in LC subject cataloging policy and practice that would improve subject access to individual works of fiction, drama, poetry, humor, and folklore in all formats;
>
> To create a set of guidelines to enable libraries to improve subject access to individual works of fiction, drama, poetry, humor, and folklore in all formats;
>
> To study the MARC format and recommend changes in tagging and coding that would improve subject access to individual works of fiction, drama, poetry, humor, and folklore in all formats;
>
> To study CIP practice and recommend changes that might ensure more timely subject access to these materials.

In the charge, subject access is taken in its broadest sense to include access by way of genre/form, fictional characters, groups, and places.[9]

In summary, the *Guidelines* "constitute a recommendation for national standard practice in the provision of subject access to individual works of fiction, drama, poetry, humor, and folklore in all formats."[10] Additionally, their formulation and publication signal the emergence of a growing trend toward the creation of systems for "improved national access to fiction" and indicates an eagerness on the part of bibliographic control specialists to address the issues raised by the projected provision of enhanced methods of access to fiction.[11] Further evidence of this trend is the recent pilot project sponsored by the OCLC Online Computer Library Center, Inc., in the enhancement of OCLC records with access points created using the SAC *Guidelines*.

In the light of these developments, studies about what Shera has termed "content-accessibility" to fiction would seem to be not only warranted but essential.[12] Certainly, the Library of Congress and other libraries across the nation might be more readily inclined to consider implementing policies that favor enhanced catalog access to fiction if it could be shown that (1) the attempt to provide more than name-and-title access to works of fiction represents a logical extension of ALA policies on access to information; (2) precedents for providing enhanced catalog access to fiction exist, both in this country and abroad; (3) the constituent elements of fiction can be extracted and translated into meaningful access points; and (4) users would welcome genre, topical, and other methods of enhanced access.

Accordingly, the purpose of the preliminary study described in this paper was fourfold: (1) to justify the provision of enhanced catalog access to fiction; (2) to identify the constituent elements of fiction that would likely be used as access points; (3) to investigate, in view of fiction's topical diversity, the feasibility of providing subject access to fictional works; and (4) to test the practicality of providing enhanced catalog access, in terms of cost-effectiveness, by measuring the time required to catalog randomly selected individual works of fiction.

ATTITUDES TOWARD FICTION

In her article "The Fiction of Access to Fiction," Sheila Intner speculates that one of the reasons why there is such cursory access to fiction in public and academic libraries is that fiction is perceived as being nonfactual or unreal, and hence, untrue.[13] Being untrue, fiction is thought to be less important, or at least, less worthy of serious study than nonfiction, which has the perceived merit of describing the actual, or real, world. This negative view of fiction against which Intner speaks is, of course, a restatement of the Platonic notion that art that imitates the real, i.e., nonideal, world is deceptive and harmful insofar as it diverts us from the contemplation of what for Plato was the "true" world of ideas.

In our own country, this philosophical mistrust of fiction, strengthened by religious fervor, is a legacy from colonial times: according to Ranta, it "originated in English and American fear of the imagination, rooted in Puritanism, and [was] later reinforced by the Scottish philosophy of Common Sense that won many American adherents during the eighteenth and nineteenth centuries."[14] Bell observes, "Well into the nineteenth century it was the consensus of American ministers, moralists, and critics that the writing or reading of imaginative literature was at best frivolous and usually dangerous."[15]

Interestingly, as the century progressed, this long-standing prejudice against the illusory nature of art became, when combined with professional zeal, the fear, on the part of some American librarians at least, that the reading of too many works of fiction could cause "fiction drunkenness" in the masses.[16] Wiegand notes that many librarians around the turn of the century, inspired by "an ideology of reading that drove the library profession at that time,"[17] believed that it was their duty to persuade their patrons to choose "improving" literature because "bad reading (as they defined it) led to bad social behavior."[18] "Classic" fiction and poetry, i.e., those works that, in the words of Ainsworth Rand Spofford, Librarian of Congress, dealt with "the highest thoughts in the most expressive language" were judged to be "improving," but popular fiction was not.[19] Indeed, by 1894 so pervasive was the disapproval of popular fiction by the library profession that the question forming the basis for a series of papers presented at the ALA Annual Conference was, "Is a free public library justified in supplying to its readers books which are not . . . good literature; which are books for entertainment only—such, for example, as the common ruck of novels?"[20] Inevitably, this attitude of disapprobation was reflected in library policy, and "As late as 1912, when the New York Public Library allowed patrons to check out four books at a time, it was stipulated that only one could be fiction."[21] However, in her book, *Fiction in Public Libraries, 1900–1950,* Esther Jane Carrier explains how the influence of this negative attitude toward fiction gradually diminished as the nineteenth century gave way to the twentieth:

> From the earliest years of the public library movement in the United States, the preference shown by the public for novel reading has been either a source of concern to library officials or a major area for library service. The Puritan condemnation of fiction reading influenced American society for many years. Nevertheless, by the end of the nineteenth century, as the reading public grew, as greater numbers joined the ranks of novel readers, and as fiction became the dominant form, the opposition to fiction reading lessened.[22]

Similarly, in Cole's view, the controversy over the inclusion of fiction had "focused on the purpose of the public library: was its prime objective educational or recreational?"[23] Therefore, when, "in the first decade of the twentieth century, as the recreational objective of the public libraries gained acceptance, so did popular fiction."[24]

Today, of course, disapproval of popular fiction is not much in evidence: Librarians no longer see their mission in life as the improvement of their patrons' minds and lives through the provision of "good," i.e., nonfiction, books. As a result of this changing attitude, there are indications that fiction is no longer considered less worthwhile than nonfiction; at least, the restrictions concerning the number of fiction books that users are permitted to charge out at one time have largely disappeared. Indeed, to judge from the literature, the impetus to provide enhanced access to fiction comes largely from public librarians interested in increasing their users' options, and in fact, the few attempts at fiction classification that exist in the literature, such as the systems developed by Frank Haigh, R. S. Walker, and Annelise Mark Pejtersen, have all been undertaken and implemented in public libraries abroad.

For the most part, however, in public libraries no less than in academic ones, fictional works remain inaccessible by content. So traditional is the lack of enhanced access to fiction in our libraries that many librarians do not even perceive it as an issue. Surprisingly, many librarians who remain doubtful about the value of enhanced catalog access to fiction are enthusiastic readers of fiction themselves, who would never dream of seriously disputing its intrinsic worth. Yet, until recently comparatively few have seemed concerned that so unique a form of knowledge is largely inaccessible by content, leading one to conclude that although the nineteenth-century disapprobation of fiction in our libraries is a thing of the past, its legacy may linger in a certain skepticism about the need for enhanced methods of access to fiction.

For some reason, librarians who would strongly oppose denying access to a work of literature because its content was controversial are nevertheless indifferent about having the same work made content-accessible, forgetting perhaps that inadequate or incomplete indexing can be as much of a bar to access as suppression. If a user who wants to find fictional depictions of insanity cannot do so due to lack of subject access, hasn't access been denied as effectively as if the material had been censored? Similarly, if a user knows only that he or she would like to read a novel "about" a given subject, how will name-and-title access help that user?

SUBJECT ACCESS IN THE ONLINE ENVIRONMENT

In a program entitled "Rethinking the Subject Catalog: Time for a Paradigm Shift," presented at the ALA Annual Conference in Atlanta on July 1, 1991, Fran Miksa spoke about the need for the new subject catalog to be "browsable." He noted that while brief descriptions of works were adequate when the subject catalog was physically close to the collection (because the user could use the catalog merely as a finding tool to locate the item and then browse the collection to see if the item was really one that contained the work he or she needed), more bibliographic information will be needed in a catalog that is dial-accessed from off site. If, as Miksa suggests, the information about nonfiction works that the subject catalog now supplies is inadequate for a user to determine, without examination of the item, whether or not a given nonfiction work would be found useful or not, then the name-and-title access currently accorded fictional works must be judged even more inadequate. Similarly, in an era of off-site access, users would be physically distant from librarians who could aid them—providing they had the time and the expertise—in accessing fiction by subject.

They might be equally distant from bibliographic sources, such as *The Fiction Catalog*, which index works of fiction topically.[25] Such sources, although admittedly better than nothing, do not provide the user with the type or degree of subject access that a catalog could provide. As Guard points out, the "major shortcoming" of sources such as *The Fiction Catalog* "is that they tell [the user] what books exist—not which ones are owned by the library, much less what is currently on the shelf or where they are located."[26]

These shortcomings would remain even if sources such as *The Fiction Catalog* were to be made available in machine-readable form. All that would change is that users, when researching a topic, would have to consult two separate subject indexes: the nonfiction index in the online catalog and the fiction index in the machine-readable source, a cumbersome arrangement at best. If, on the other hand, fiction were given subject access in the catalog, fiction and nonfiction subjects would collocate in the same file, allowing the user to see, in one display, citations for both fictional and nonfictional treatments of his or her topic of interest. As our catalogs become increasingly able to inform a user even of a desired novel's circulation status, why should that user still have to consult a reference librarian or a bibliographic source to find out something about that novel's subject? Similarly, is the "convenience of the public" served when librarians permit users, via the subject catalog, to find unknown but relevant nonfiction items but not unknown fictional ones?

BARRIERS TO ENHANCED CATALOG ACCESS TO FICTION

To be sure, some of the reluctance that surrounds the provision of enhanced access to fiction stems neither from the remnants of a puritanical attitude nor from an undervaluation of fiction's merits as a source of information, knowledge, and experience, but rather from a perception that the whole endeavor will be impossible to accomplish. Apparently, a great stumbling block to providing enhanced access to fiction, especially subject access, is the difficulty of deciding what a work of fiction is about. Indeed, although "aboutness" remains an elusive concept even as far as nonfiction works are concerned, fictional works are even more resistant to categorization than nonfiction works because they can exist on several different levels at once: the literal, the symbolic, and the thematic. For example, on a literal level, the novel *Howards End* by E. M. Forster is about a woman, Ruth Wilcox, who bequeaths her house to an acquaintance rather than to her surviving husband and children. Of its plot, the critic Lionel Trilling comments, "Like the plots of so many English novels, the plot of *Howards End* is about the rights of property, about a destroyed will-and-testament and rightful and wrongful heirs."[27] On another level, however, "the story moves by symbols and not only its characters but also an elm, a marriage, a symphony, and a scholar's library stand for things beyond themselves." Symbolically, "England herself appears in the novel in palpable form"—as Howards End.[28] Finally, on yet a third, thematic level, "*Howards End* is a novel about England's fate. . . . It asks the question, 'Who shall inherit England?'"[29] Thus, using *Howards End* as an example, it can be seen that although the theme of the novel (who shall inherit England?) is related to what the novel is ostensibly "about" (who shall inherit Mrs. Wilcox's house?), it is not exactly the same thing.

Indeed, Forster's work illustrates how both denotative, i.e., fact-like, and connotative, i.e., thematic, elements may function simultaneously as topics of a work, and this mix of "concrete and abstract levels of meaning" is typical of fiction's multidimensional character.[30] Whereas in older genres, such as fables, themes are often directly expressed as morals, in more modern fictional genres such as the novel or the short story, themes are commonly expressed indirectly through connotative elements such as imagery or point of view. For example, when Ransley created a subject index to *The Scarlet Letter*, one of the ways in which he brought out the novel's themes was by indexing symbols such as iron, "signifying Puritan severity and intransigence."[31] Similarly, Ransley indexed for point of view "by looking to literary criticism and drawing upon the main and most long-standing readings of *The Scarlet Letter*: the Puritan, Romantic and Transcendental."[32] Clearly, subject access to novels such as *Howards End* and *The Scarlet Letter*, in which meaning is most tellingly expressed through connotative elements, would be incomplete without thematic access points.

THE ERA OF ENHANCED CATALOG ACCESS

There are indications that the era of enhanced catalog access to imaginative literature is upon us. For more than a decade, librarians like Pejtersen, Berman, Scilken, Harrell, Sapp, Baker and Shepherd, Intner, Ransley, Guard, and Ranta have written about the need for greater access, particularly subject access, to fiction.[33-42] Users, it seems, persist in approaching fiction by subject, even when subject "access" is limited to a librarian's guidance. At the same time, there is evidence to suggest that the subject approach is one favored by readers of nonfiction as well; Mandel recently reminded an audience of catalog librarians of the popularity of subject searching with users, citing several of the studies by the Council on Library Resources on online catalog use.[43] These studies revealed that online catalog users not only "are conducting more subject searches than most librarians generally believe they do,"[44] but that the great majority of searches conducted, amounting to 73 percent, are now known to be subject searches.[45] Similarly, Larson cites studies of online catalog use that found that subject searching "was the most frequently used form of online catalog search."[46] Therefore, as there is anecdotal evidence that users commonly approach fiction by subject, and empirical evidence documenting the popularity of subject searching, it is reasonable to conclude that users of online catalogs might want to gain access to imaginative literature by subject. The question then becomes, "Given that current methods do not accomplish the task at hand, and given that patrons do want greater access to fiction, why then are libraries not rectifying the situation?"[47]

PREVIOUS STUDIES

TYPES OF STUDIES

The literature on enhanced access to fiction falls into two broad categories: apologies for access to fiction by genre and subject and descriptions of specific fictional classification schemes.

The apologies vary in kind from Intner's informal opinion piece to Ranta's scrupulously researched theoretical discussion. One of the most informed and constructive is Guard's, especially her description of what it is like to serve patrons who approach fiction by subject when subject access is limited to a few bibliographic sources and the librarian's memory and expertise. Guard's most interesting idea, however, is her proposal for "Analogy Software, a computer program that could supplement the librarian as reader's advisor."[48] Using this software, the reader who enjoys reading Reynolds Price, for example, could type in his name, and the program would respond with the names of other writers that are in some way similar to Price, such as Allan Gurganus, Carson McCullers, and Eudora Welty.[49]

The classification descriptions are more homogeneous, all being largely concerned with systems providing content accessibility to works of fiction in public libraries.

CLASSIFICATION SCHEMES FOR FICTION

A considerable proportion of the literature on enhanced access to fiction is comprised of analyses and outlines of classification schemes for fiction. The definitive analysis of these is a two-part article by Clare Beghtol.[50,51] Covering proposed fiction classification schemes published from the 1890s to the 1980s, Beghtol speculates on the reasons bibliographic classification theory and practice have not been as fully developed for the humanities as for the sciences. Specifically, she asks why classification schemes have not been used for "content elements of primary works of fiction."[52] Beghtol characterizes the usual practice of arranging works of fiction in a library—access by author—as embodying the principle of "'classification-by-creator' instead of the more usual principle of 'classification-by-subject.'" Her paper enumerates some of the reasons why classing fiction by creator has seemed both "convenient and satisfying," among them the obvious one that library users want access to "works by" as well as "works about." Then, Beghtol goes on to examine the need for, and feasibility of, systems of content access for fictional works. In addition, she analyzes several systems for fiction classification in detail, noting their similarities and unique features and describing their weaknesses. Finally, she calls for further research "to ascertain which elements of fiction may be extracted in a relative [sic] objective manner and how classifiers are to decide the relative importance of elements in a particular novel."[53] For the purposes of analysis, Beghtol groups existing fiction classification schemes into the following categories: general fiction classification schemes, adaptations of general nonfiction schemes, and systems of genre identification.

The classification system devised by Frank Haigh is an example of an adaptation of a general nonfiction scheme.[54] In 1933, Haigh classified approximately 5,000 books in a branch of the Central Public Library in Halifax, U.K., with what he called the 1889 edition[55] of the *Dewey Decimal System*.[56] In adapting the *DDC* to use with fiction, Haigh frequently dropped part of the class name, as when "'218 Future Life. Immortality. Eternity' became '218 Future Life.'"[57] Occasionally, Haigh added a term to a class name, but as Beghtol comments, "In no case did he change the essential meaning of the class name, so his deviations seem no more incoherent than DDC3 itself."[58] Of Haigh's particular innovations, Beghtol feels that two of the more dubious were to classify novels on "Novelists and Writers" in 029, i.e., "Literary Methods and Labor Savers," and to create a special biography class that included "biography" of fictional and nonfictional characters, such as *Jane Eyre, David Copperfield,* and *Messer Marco Polo.* Although we know that books in the Central Public Library were shelved using Haigh's classification and that a classified catalog with an index was provided, there is no record of user interaction with Haigh's system, so it is difficult to assess its effectiveness in enhancing access.

Perhaps the most common method of arranging fiction, at least in public libraries, is by one of the genre identification systems. The major feature of this type of system is the grouping of novels by nonexclusive type or kind, such as "mystery," "romance," "historical fiction," "western," or "adventure" novels. Baker and Shepherd have extensively reviewed various genre identification systems used in American libraries.[59,60] Baker went on to conduct a study to determine whether classifying fiction into genres could "focus use by browsers who are subject to the effects of information overload," finding that such arrangements did indeed improve service to users.[61] Similarly, Harrell discovered that forty-six out of forty-nine large American libraries, or 94 percent, used genre categorization to arrange and organize a part of their fiction collections.[62] Such genre arrangements, too numerous to discuss in detail, indicate that American librarians are at least attempting to provide their users with some form of enhanced access to fiction.

Of the general fiction classification schemes, an especially interesting one is R. W. Walker's, which appeared in an article in *Librarian and Book World* entitled "Problem Child: Some Observations on Fiction, with a Sketch of a New System of Classification" and which, lacking another name, has become known as the "Problem Child" classification.[63] Walker's classification is complex, and I owe my understanding of it to Beghtol's lucid explication of its significant features in the second part of her two-part article on fiction classification schemes.[64] Problem Child is a hybrid, influenced by the classification schemes of Bliss and Ranganathan, that has "a nonhierarchical mixed retroactive notation" in which "upper case letters A–H are used as facet indicators and J–Z are used retroactively for subdivision within a facet."[65] She notes that Walker analyzed fiction into the facets of author, subject, narrative, language, and literary period, which correspond to Ranganathan's personality, matter, energy, space, and time. The narrative/energy facet contains three subfacets, namely form, plot, and style. One of the most interesting features of Problem Child is Walker's distinction of objective and subjective fictional themes. Within the narrative/energy facet, themes are classed as "theme-objective" when an idea is implicitly dominant in the composition, but as "theme-subjective" when an emotion dominates the work.[66] Although never tested outside the library system in Lanarkshire, Scotland, for which it was developed, Walker's system is of interest chiefly for its incorporation of elements of Ranganathan's Colon Classification. Nevertheless, in Beghtol's view, Walker's Problem Child classification offers "potentially fruitful ideas for classifying fiction."[67]

An even more complex fiction classification scheme is the Analysis and Mediation of Publications, or AMP, devised by Annelise Mark Pejtersen for use in public libraries. Besides being given an extensive analysis in Beghtol's two-part article, the AMP system is described in a two-part article by Pejtersen and Jutta Austin and in a shorter article by Pejtersen.[68-70] Of all the fiction classification schemes under discussion, the AMP system is easily the most user oriented; before constructing her system, Pejtersen decided to find out how users request guidance about fiction and to use that knowledge as the basis of her classification. Accordingly, she monitored over 300 conversations between users and librarians in selected public libraries in Denmark, discovering that the way users characterized the contents of novels was multidimensional, and could therefore be expressed in four different dimensions: (1) subject matter; (2) frame (time/place); (3) author's attitude/intention; and (4) accessibility. In the AMP system, these four independent, user-determined dimensions are further subdivided into a few broad categories:

1. Subject matter—the subject content of a novel, what the story is about—including action and course of events, psychological development and description, and social relations;
2. Frame—the setting in time and place chosen by the author as the scenario of his work—including time (past, present, future) and place (geographical, social environment, profession);
3. Author's intention—the theme of a novel, i.e., the author's attitude towards the subject or the set of ideas and emotions that the author wants to communicate to his readers—including emotional experience and cognition and information; and
4. Accessibility—the level of communication, described in terms of those properties that can facilitate or inhibit communication, e.g., difficulty of language, composition, typography, size, etc.—including readability, physical characteristics, and literary form.[71]

Since the dimensions are not mutually exclusive, each novel is classed in every dimension and category that a reader might reasonably expect to find it, and further specificity is provided by the addition of headings established by the individual libraries where the AMP system is used. As can be seen, the AMP system differs markedly from other fiction classification schemes in that it cannot be used for shelf arrangement, nor does it employ notation. In Beghtol's view, the AMP system may be criticized for inadequate definitions of the scope of its dimensions and lack of directions for classifiers; in addition, Beghtol feels that the AMP system, with its "successive summarizing steps that find final expression in an abstract," is less an indexing or classification system than "a tool for writing annotations."[72] However, when the AMP system underwent retrieval tests, the only fiction analysis system to have done so, the results were good. Nevertheless, Pejtersen and Austin caution that the main value of these results, "seems to lie in their role as 'trend-indicators,' i.e., in the identification of possible patterns of user behavior in fiction searches."[73]

One admirer of the AMP system is Greg Sapp. Specifically, Sapp praises the AMP system for being especially sensitive to user needs; in addition, he evaluates other fiction classification systems from "the perspective of how well they answer likely reader queries regarding what a novel is 'about.'"[74] Furthermore, Sapp goes on to develop what he calls "the levels-of-access" concept for comparing fiction classification schemes, which he describes as furnishing a common reference point with two facets: (1) the level of detail at which a subject is conveyed and (2) the number of access points that are provided. Sapp contends that by developing systems of enhanced access to fiction, librarians would benefit a wide spectrum of users, from the literature scholar, who wishes to perform comparative analyses of fictional themes but has little bibliographic recourse to relevant materials, to the general reader, who wants to explore fiction by topic. Moreover, according to Sapp, librarians themselves would benefit from the implementation of enhanced access; it would afford them new opportunities for growth by giving them the opportunity to devise new kinds of reference and readers' advisory services. Indeed, Sapp concludes that the perceived difficulties involved in the provision of enhanced access to fiction has "led to the neglect of what could well be the most popular, interactive services that the profession can provide."[75]

OTHER FORMS OF ENHANCED ACCESS

In the literature of enhanced access to fiction, one of the few studies that deals solely with the assignment of subject headings is DeHart and Matthews' "French Fiction: *LCSH* Applications."[76] DeHart and Matthews examined the application of *LCSH* to French fiction in order to identify areas for possible improvement by comparing them with Modern Language Association (MLA) coded descriptors. DeHart and Matthews stress that due to the nonrandom method of sampling that they used, their results cannot be generalized; nevertheless, it is interesting to learn that in no case was the concept of an MLA descriptor unable to be formulated from the *LCSH* list. DeHart and Matthews call for the continued assessment of MLA descriptors in comparison with *LCSH*, especially as regards their relative specificity.

Another study that focuses on the assignment of subject headings and affords excellent comparative data was conducted by the Subject Cataloging Division of the LC. Its purpose was to investigate the SAC Subcommittee's Recommendations on Subject Access for Individual Works of Fiction, Drama, etc. Two staff members were asked to select a random sample of individual works of fiction, drama, etc. from among the titles received by the division during a given week and to determine what the impact of assigning the SAC Subcommittee subject headings would be. Following the recommendations from the SAC Subcommittee, the two staff members were asked to examine selected titles in contemporary English fiction. During the five days of the study, fifty titles were received in this category, and twenty-five titles were selected by unspecified means for consideration. The two staff members examined the works and determined whether headings in each of the four categories of proposed additional headings (genre and form, fictitious character, topical subjects, and setting—location and time) should be assigned. Additionally, the staff members were asked to record the amount of time it took to determine the required headings, whether or not development of new subject headings was necessary, and the amount of time it would take to complete the development work. In one of the study's most important findings, the cataloging time for the fictional works varied greatly between the two staff members; whereas one cataloger took only 4.3 hours to catalog the twenty-five titles, the other took almost 18.3 hours to catalog the same twenty-five titles, indicating a need for more explicit guidelines to produce more uniform application of the recommendations.

One of the most recent projects dealing with the application of subject headings to fiction is *Olderr's Fiction Subject Headings: A Supplement and Guide to the LC Thesaurus* by Steven Olderr. Published in 1991, Olderr's thesaurus is meant "to supplement and explain the *Library of Congress Subject Headings* so that the subject headings therein may be used with works of fiction."[77] In addition, Olderr has supplied additional cross references, scope notes, and some new headings particularly applicable to fiction. Unlike the SAC *Guidelines on Subject Access to Individual Works of Fiction, Drama, etc.*, Olderr's thesaurus supplies topical and genre headings to be used in cataloging fiction. Moreover, with its fiction-specific subject headings and discriminating scope notes, Olderr's thesaurus compares favorably with the *Guidelines* in its specificity, its detail, its comprehensiveness, and its invention. Although both systems have merit, they invite comparison all the more so since they were issued by the ALA in successive years, an occurrence that does not speak well for cooperation, much less communication, within the profession.

BIBLIOGRAPHIC SOURCES

A few bibliographic sources have long provided some degree of subject access to fiction. *The Fiction Catalog*, first published by H. W. Wilson in 1908 and published periodically thereafter (new editions are published quinquennially with annual supplements), comprises: (1) an alphabetical list of recently published works of fiction in English and in translation, each with a descriptive summary and an excerpt from a review; (2) a title and subject index to part 1; and (3) a Directory of Publishers and Distributors.[78] Although an extremely useful bibliographic tool and valuable for its wide range of topics, including those found in books for children and young adults, *The Fiction Catalog* has several limitations: (1) the list of topics indexed in part 2 is limited to those found in part 1's featured works and so cannot be said to be comprehensive; (2) denotative elements are indexed in much greater depth than connotative elements; and (3) relationships among terms are rarely expressed.

Another source that has a good subject index is the *MLA International Bibliography of Books and Articles on the Modern Languages and Literatures*.[79] An indication of its merit is that, in a study by DeHart and Matthews, *LCSH* lists were applied to French fiction and then compared, for scope and comprehensiveness, with MLA coded descriptors.[80] Unfortunately, however adequate its subject index may be for application to works of imaginative literature, at the present time the *MLA Bibliography* only indexes critical works, making its use as a source of subject access to imaginative literature extremely limited.

In addition to *The Fiction Catalog*, the H. W. Wilson Company publishes the *Short Story Index*[81] and the *Play Index*,[82] which provide subject coverage to short fiction and drama analogous to that provided by *The Fiction Catalog* for novels. Similarly, there are sources such as the *Columbia Granger's Index to Poetry*[83] that index poetry by author, title, and subject.

However, although these sources are much better than nothing, they cannot be said to provide comprehensive subject indexing for works of imaginative literature comparable to that provided by the *LCSH* for nonfiction. Furthermore, since a work's appearance in these sources is tied to the publication of that work or its reissuance in a new edition, works indexed in early editions are not included in later editions and, in fact, may only appear in one five-year cumulation.

ENHANCED CATALOG ACCESS TO FICTION IN ACADEMIC LIBRARIES

Although support of enhanced access to fiction has been growing steadily in recent years, as a trend it has been almost exclusively associated with public libraries; classification schemes for fiction such as Pejtersen's, Haigh's, and Walker's were created for use in public libraries. Similarly, most articles in library journals advocating enhanced access to fiction have focused on the plight of the recreational reader seeking in vain for a book about a particular topic. But, as Ranta points out in a ground-breaking article, "While for decades public librarians have been pointing out problems caused by the general lack of subject catalog access to imaginative literature, few people seem to realize that this is a problem for users of academic and research libraries as well."[84] The great merit of Ranta's article is that she explains *why* lack of subject access to fiction is as great a problem for users of academic and research libraries as for users of public libraries.

Ranta contends that "new developments in literary scholarship and interdisciplinary trends" and "new techniques in literary criticism have brought about a greater interest in studying topical and other cultural/historical features of literary texts."[85] At the same time, "there have been attempts from many directions to open up the canon to include more writings by members of all socio-economic, ethnic, and racial groups, and the whole issue of what constitutes literary value is being re-examined."[86] As the canon expands, "problems of library retrieval grow. Students and scholars can no longer expect to know the canon the way previous generations could."[87] In Ranta's view, librarians must respond to this changing curriculum by offering enhanced methods of access to literary materials. She asserts that:

> Library access would be improved by the provision of subject and form headings for

> works by individual authors, not only because the canon of authors and titles is growing, but also because new literary theory often involves studying elements of imaginative literature other than the *purely* literary. . . .
>
> Thus, literary scholars now often have a different set of values in mind as they go about their work. They might be looking for a text by a writer from a certain cultural group or a text addressing a particular topic. In these instances, author and title catalog access is insufficient.[88]

Another merit of Ranta's article is her perception that techniques other than cataloging and disciplines beyond bibliographic control may shed some light on how librarians might go about developing subject catalog access to imaginative literature. For example, she illustrates, by creating *LCSH*-type subject headings for *The Scarlet Letter*, how critical interpretations of classic literature could be used by subject catalogers in creating subject headings for fiction. Similarly, in her extended discussion of Ambrose Ransley's back-of-the-book index for *The Scarlet Letter*, she suggests many ways in which Ransley's indexing decisions could be adapted for cataloging purposes. Finally, in citing Sara Shatford's work on subject cataloging for pictures,[89] Ranta reminds us that, "since pictures can have the same multiple-layered quality as imaginative literature," discussion of subject access to visual materials "is especially helpful for considering the kinds of subjects a work of imaginative literature can have and how they might be given access."[90]

Ranta concedes that there are many "deep problems" involved in providing subject access to imaginative literature, but she insists that "the extent of the need for subject access must override the difficulties, especially in light of the changes in literary scholarship and the interdisciplinary trend in other fields."[91]

GENRE ACCESS

Besides topical access, enhanced catalog access to fiction comprises access by genre or form. Stressing the need for genre access, Patrick Wilson and Nick Robinson assert that "description of genre or kind is important because the idea of genre or kind is the idea of a range of conventional procedure that guides both the performance of producers (if only in the direction of deliberate flouting of convention) and the expectation of users."[92] Wilson and Robinson recommend that in the subject catalog, topic and kind descriptions should be paired whenever possible, and, far more radically, suggest the extension of genre access to non-literary works.

A good study of popular genre fiction is Betty Rosenberg's *Genreflecting: A Guide to Reading Interests in Genre Fiction*, a textbook for library school students intended to familiarize them with common reader interests in genre fiction.[93] Besides containing exhaustive lists of various kinds of genre fiction, *Genreflecting* is a defense of genre fiction against those who would denigrate it for lacking in literary quality; indeed, Rosenberg suggests that works designed merely to entertain are nevertheless worthwhile simply for the pleasure they afford readers. Furthermore, Rosenberg observes that increasingly, the academic world has tempered its scorn of genre fiction to the extent that courses in the western, the detective-and-mystery story, science fiction, and fantasy are now being offered at secondary and college levels. Similarly, articles on genre fiction are frequently featured in the *Journal of Popular Culture*, a quarterly publication of the Popular Culture Association and the Modern Language Association of America.

DEFINITIONS

Several terms need to be defined as used in this study. Using Shera's terminology, *enhanced access* to fiction is defined as access by form and by topic.[94] *Fiction* and *imaginative literature* are used interchangeably to mean any made up or imagined literary works, although *literature* may connote fiction of which "some criterion of quality or value (intellectual, moral, aesthetic, political, national) is implied."[95] *Genre*, as its etymological roots in the Latin word *genus* (kind) suggest, is defined as literary type.[96] Since criteria for defining each of the many literary genres are neither precise nor mutually exclusive, e.g., a detective story and a suspense novel may both feature the investigation of a murder by an unknown assailant, genres are defined differently by different literary critics. That being the case, genres used in the present study were those designated in the SAC *Guidelines*.

To continue with definitions, the *setting* of a work of fiction is the time and the place in which the events occur.[97] Theoretically, the time may mean the hour, the season, or the era in which a story is set. Similarly, the place may be geographic (in a house, on a moor) or psychological (in a character's mind). For cataloging purposes, however, *setting* was defined as the geographic location of the story and the century, decade, or year (whichever could be determined) during which the events of the story took place. For the present study, the recommendations of the SAC Subcommittee on Individual Works of Fiction, Drama, Etc. were followed, and place names were established by consulting *LCSH* or the LC authority file available through OCLC.

For the purposes of this study, *subject* was defined as what a given work was about. A working definition was used reflecting Wilson's view that catalogers would do better to admit that they possess no precise definition of the word *subject*, rather than pretend that the definitions they have are adequate. "For years, Cutter's statement that one of the objects of the 'dictionary catalog' of a library was 'to show what the library . . . has on a given subject' has been repeated, without explanation, as if it were obvious what 'being on a given subject' meant."[98] For Wilson, there is nothing obvious about it.

AIM AND SCOPE

The current study was exploratory in nature, its purpose being to extract elements of selected fictional works in an effort to ascertain (1) whether such elements are specific and discrete enough to serve as meaningful access points, and (2) whether providing enhanced catalog access to fiction would take more time than a working subject cataloger could realistically spend. In the literature, it is suggested by Sapp among others, that fiction's topical diversity may preclude its "monolithic classification"[99] and complicate its analysis by any system of subject access. Similarly, doubts have been expressed by many bibliographic control specialists concerning the prohibitive amount of time (in terms of cost-effectiveness) such provision would entail.

The current study was therefore undertaken in an attempt to determine whether providing enhanced catalog access to fiction was (1) feasible and (2) practical. Feasibility was tested by extracting elements of works of fiction and translating them into a system of topical and genre access; practicality was addressed by measuring the time it took to do so. The type of imaginative literature selected was the novel; poetry, drama, and shorter prose forms were arbitrarily excluded.

The current study also endeavored, in a preliminary way, to discover something about the make-up of fiction itself. Although exhaustively studied by literary critics, fiction has seldom been analyzed from a cataloger's perspective. Accordingly, in order to learn more about the phenomenon of fiction itself, with a view to accumulating data to be used in its bibliographic control, the relationship of fictional settings to genres was explored. Specifically, analyses were conducted to determine (1) whether there was any one genre that featured either very many or very few settings and (2) what the average number of settings was in randomly selected works of various genres.

METHODOLOGY

A random sample of fictional works was selected from the fiction collection of a small suburban public library. The card catalog contained 114 drawers, each forty centimeters in length. Two sets of random numbers were generated: one set from 1 to 114 to represent drawers, another from 1 to 40 to represent positions within the drawers. Since controlling for possible bias that can be introduced due to varying card thicknesses requires that the *n*th card behind the randomly selected drawer be chosen, a third set of random numbers was generated.[100] To obviate the problem of unequal probabilities, only main entry cards were chosen. In this manner, fifty titles were selected; however, when a selected title was checked out, nonfiction, or a form of fiction other than a novel or novella, it was thrown out. Similarly, since none of the selected works had more than one edition in the catalog, selections did not have to be restricted to first editions. Fifty titles were selected for two reasons: (1) to replicate the Subject Cataloging Division's (SCD) study and (2) because it was determined, using the formula for estimating sample size when proportions are involved outlined by Sproull, that a sample size of at least forty-eight would be needed in order to obtain a confidence level of 85 percent, with a 0.10 proportion of tolerable error.[101] Due to the study's preliminary nature, a relatively low confidence level was deemed to be appropriate.

The cataloging phase was conducted in two parts. The first phase consisted of selecting the item and examining the work it contained (as well as the dust jacket and any introductory material) in order to ascertain its subject, genre, and setting or settings. Next, the number of significant settings was noted, significant settings being geographic locations where a fair amount of the action of the work takes place. (What constitutes a "fair amount" was deliberately not quantified; such considerations, in this study as in an actual cataloging situation, were properly left up to the judgment of the individual cataloger.) Because the SAC guidelines mandate time period as part of setting, the year, the decade, or the century in which the work was set (whichever could be determined) was noted. Genre headings were assigned, and using the thirteenth edition of *LCSH*, topical subject headings were assigned by adapting established LC headings by the addition of the subdivision —Fiction. (Unfortunately, the present study antedated the publication of *Olderr's Fiction Subject Headings: A Supplement and Guide to the LC Thesaurus*. Had it not done so, that system would have been used.) The time it took to determine setting and to assign genre and topical subject headings was noted and recorded. Next, place names were established for the principal setting of each work using *LCSH*, the LC authority file accessed through OCLC, or, for a few settings, reference books from the reference department in Butler Library, Columbia University, and the time it took to do this was recorded.

ANALYSIS AND RESULTS

The data for the current study were entered into a computer file using *SPSS/PC+ Studentware* software and analyzed using procedures outlined in the *SPSS/PC+ Studentware* manual.

The results of the SCD's study were compared with those of the current study, to see if the SCD's findings were supported. Because time is an important factor in assessing the practicality of a given cataloging practice, it was interesting to learn that it took each of the two SCD catalogers widely varying amounts of time to catalog the same twenty-five titles. While the "slow" cataloger took 18.3 hours to catalog all the titles, the "fast" cataloger took only 4.3 hours. The cataloging time for the current study fell between these two extremes: one group of twenty-five titles taking 7.20 hours to catalog, the second group taking 6.30 hours to catalog. Similarly, in the current study, the time it took to create an average record was 16.29 minutes, compared with 47 minutes for the SCD's slow cataloger and 14.3 minutes for its fast cataloger. Again, the mean cataloging time of the current study fell between the means of the slow and fast catalogers. In order to generalize from the sample to the population of novels occurring in the sampled population, a confidence level of 85 percent was estimated, with an upper limit of 17.58 minutes and a lower limit of 15 minutes.

In addition to supplying data about the time it takes to provide enhanced access to fiction, the current study was designed to provide some data about the relationship of setting to genre. The research question was posed, do some genres feature more settings than others? Through an analysis of means it was learned that the average number of significant settings featured in the fictional works of all genres was two. Romantic suspense, with an average of 3 settings per work, and historical fiction, with an average of 2.8 settings per work, had the highest number of average settings; detective and mystery stories, with an average of 1.3 settings, and western stories, with an average of 1 setting, had the lowest number of settings per work. To determine whether the differences in the mean number of settings for each genre were statistically significant, a χ^2 test was performed to test the relationship of number of settings to genre. However, a χ^2 test performed on a cross-tabulation table of setting by genre could not be used, as over 96 percent of the cells had expected values of less than five, meaning that the null hypothesis that there are an equal number of settings in all genres in the population could not be rejected. Finally, an analysis of variance (F test) was done to see how much the mean number of settings varied from genre to genre. Since the ratio of variances of 0.8854 was close to 1, the null hypothesis that there are the same number of settings per genre in the population of fictional works from which the sample was drawn could not be rejected.

SIGNIFICANCE OF THE STUDY

In his book *Objective Knowledge: An Evolutionary Approach*, Karl Popper characterizes three "worlds" of knowledge: "We can call the physical world 'World 1,' the world of our conscious experiences 'World 2,' and the world of the logical contents of books, libraries, computer memories, and such like, 'World 3.'"[102] It can readily be seen that Popper's World 3 is the province of the librarian; moreover, librarians act as intermediaries between the documents comprising World 3 and the information needs of their patrons, needs that Popper would characterize as belonging to World 2, or the world of thought processes. Using Popper's typology, one can say that information-seeking behavior is an attempt to incorporate World 3 objects, i.e., products of thought, into World 2 states of mind, i.e., thought processes. Furthermore, if the information seeker is a scholar, information or knowledge retrieved from World 3 documents may be used in the creation of new knowledge; knowledge that, when recorded, published, acquired, and stored, will in turn become part of Popper's World 3. It must be remembered, however, that in order to be retrieved from documents and used in the creation of new knowledge, information has to be found, but unless fiction is indexed according to topical content, as nonfiction is, information contained in it may remain forever undiscovered.

Traditionally, only works of nonfiction have been readily accessible by topic, and due to Cutter's Rule 161, they are often to be found in the subject catalog under a subject heading specific to that topic; "Put Lady Cust's book on 'The cat' under CAT, not under ZOOLOGY or MAMMALS, or DOMESTIC ANIMALS."[103] Accessing the topical information contained in fiction, however, is not so straightforward, although any reader can testify that, besides imparting a distinctive kind of knowledge about life not found elsewhere, fictional works are filled with factual information of all kinds. For example, consider how much one learns about the treatment of tuberculosis at the turn of the century from Mann's *The Magic Mountain* or about the campaigns of Alexander the Great from Mary Renault's *The Persian Boy*. Similarly, when Laurence Stone, in his study *The Family, Sex and Marriage in England, 1500–1800*,[104] includes a long quotation from *Mansfield Park* in his discussion of "the companionate marriage" we take it as a matter of course. How could Stone have discussed marriage in early nineteenth-century England without citing Jane Austen, whose novels, besides being great art, are filled with information about marriage practices and customs as they existed among the English gentry in the first years of the nineteenth century? Stone was able to find information relating to the companionate marriage in *Mansfield Park* because he knew that it was there, no doubt having read Jane Austen while growing up.

But what about the wealth of information not contained in classic, and hence familiar, literature? Must it be inaccessible, unless stumbled upon serendipitously when reading for pleasure? Unfortunately, most information embedded in fictional works must be regarded as arcane, in its root meaning of "hidden," since it is not displayed in the subject catalog. Indeed, instead of a user being able to see in one display all that a library has on a given subject, regardless of whether that information is contained in fiction or nonfiction, he or she must consult the subject catalog *and* a bibliographic source such as *The Fiction Catalog*, presuming he or she (1) is aware of its existence, (2) is certain that the needed work has been selected for inclusion, and (3) requires no references or other expressions of relationships. Such a multistep procedure, besides inconveniencing the user, is undesirable because it flies in the face of the objectives of the catalog, past and present.

Kathryn Weintraub has suggested that what Cutter meant by his second "object" for the dictionary catalog, namely, "To show what the library has: . . . by a given author . . . on a given subject . . . in a given kind of literature," can best be described as a collocating or gathering function.[105] Although Cutter was thinking of nonfiction subjects, one may question by extension whether the collocating function of his second object, as identified by Weintraub, is being fulfilled if fictional subjects, identified as such by such qualifiers as "—Fiction," "in Fiction," or "Fictional," are excluded from the catalog. Similarly, in an era when even circulation information is being included in the online catalog, the better to effect the so-called "one-stop shopping" method of access, the exclusion of the knowledge and information contained in fiction seems not only difficult to justify, but inconsistent as well.

Finally, the recent trend towards interdisciplinary studies and the new techniques in literary scholarship that focus on topical and cultural/historical features of literary texts seem to call for improved methods of accessing collections of imaginative literature in academic, as well as public, libraries.

In a recent article about the bibliographic control of nonbook materials, Richard Smiraglia describes Patrick Wilson's conceptual framework for bibliographic control and contends that it can be seen as the basis for a theoretical construct. Of Wilson, Smiraglia writes:

> He suggests the existence of two domains of bibliographic control, which he refers to as descriptive and exploitative. Descriptive control is used to organize a body of bibliographic objects. Exploitative control is the ability to make the best possible use of a body of knowledge. Wilson sees exploitative control as the superior, if unattainable, of his "two kinds of power"; descriptive control as the inferior, if more readily available.
>
> Exploitative control is what users need. Descriptive control is what we have in our libraries to guide them. The various orderings of the objects provide pathways to understanding the relationships among the works they contain, thus offering the user some opportunities to make the best possible use of a body of knowledge.[106]

Underlying Smiraglia's essay is the conviction that nonbook materials merit the same level of descriptive control that has traditionally been accorded to books. Extending Smiraglia's thesis to fictional materials, one can argue that name, title, and single generic access for multigeneric works do not constitute appropriate descriptive control for fiction. Without enhanced catalog access, what Smiraglia terms the user's "pathway" to works of the imagination is partially obscured, with name, title, and sometimes genre as the only signposts. Name and title access, though immensely valuable, especially to those already knowledgeable about literature, is simply not adequate for the nonexpert's needs. For example, a reader interested in fictional works "about" the British Raj might easily find works such as *The Raj Quartet*, or even *A Passage to India*, whose titles give clues to their common subject, but without topical access, the same reader would probably not know that the novel *Staying On*, the comic sequel or ironic postscript to Scott's monumental tetralogy, also deals with the consequences of British rule in India. Finally, it does not say much for present day bibliographic control practices that public library users should have to depend on a marketing device of the publishing industry, namely, a book's dust jacket, to gain descriptive control of fiction, while users of academic libraries' fiction collections do not even have dust jackets to guide them.

If enhanced catalog access to fiction were provided, however, the objectives of the subject catalog, as enumerated by Cutter, would at last be achieved. At the same time, "the convenience of the public," whose members often approach fiction by topic, would truly be served. This study has been an attempt to provide some preliminary data about cataloging fiction. It has been carried out in the belief that, whether used for escape, entertainment, experience, or enlightenment, as a source of pleasure, knowledge, information, or art, fiction merits more comprehensive access than it is presently accorded in our libraries.

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APPENDIX A: CASES

The works that the following cases represent were cataloged using the guidelines designated in *Guidelines On Subject Access To Individual Works of Fiction,* *Drama, Etc.*, final report to the Cataloging and Classification Section (CCS) Subject Analysis Committee (SAC) Association for Library Collections & Technical Services (ALCTS) Subcommittee on Individual Works of Fiction, Drama, Etc.

Example

1. Genre and Form Access
2. Fictitious Character Access
3. Expanded Topical Subject Access
4. Topical Subject Heading Access to Setting (Location and Time Period)

In addition to the four access points recommended by the Subcommittee I have added, for the purposes of this study, two items of information:

5. Number of settings per work (including the principal setting brought out in number 4)
6. Amount of time it took to catalog the work in minutes

Finally, in addition to using the subject headings listed in the SAC final report, I followed Subcommittee guidelines in constructing new subject headings by adding the subdivision—**Fiction** to established LC subject headings.

Case #8

Under plum lake / Lionel Davidson ; drawings by Muriel Nasser. — New York : Knopf, 1980.

1. Fantastic fiction, English
2. none
3. Voyages, Imaginary—Fiction
4. Cornwall (England : County)—20th century
5. 2
6. 12 min.

Case #14

The sea above them / John Wingate. — New York : St. Martin's Press, c1975.

1. Adventure stories
2. none
3. Nuclear submarines—Fiction
   Sea stories—Fiction
4. Barents Sea—20th century
5. 2
6. 12 min.

Case #21

The massacre at Fall Creek / Jessamyn West. — New York : Harcourt Brace Jovanich, c1975.

1. Western stories
2. none
3. Massacres—Fiction
   Seneca Indians—Fiction
   Indians of North America—Indiana—Fiction
4. Indiana—20th century
5. 1
6. 23 min.

Case #22

Stately homicide / S.T. Haymon. — New York : St. Martin's Press, c1984.

1. Detective and mystery stories
2. Jurnet, Ben (Fictitious character)
   RT Haymon, S. T.—Characters—Ben Jurnet
3. Murder—Investigation—Fiction
   Country homes—England—Fiction
4. Norfolk (England)—20th century
5. 2
6. 13 min.

Case #41

A month in the country / J. L. Carr. — New York : St. Martin's Press, c1980.

1. English fiction—20th century
2. none
3. Love—Fiction
   Art conservation and restoration—Fiction
4. Yorkshire (England)—20th century
5. 1
6. 19 min.

Case #48

The Howards of Caxley / Miss Read. — Boston : Houghton Mifflin, 1968.

1. English fiction—20th century
2. none
3. World War, 1939-1945—Fiction
   Village communities—Great Britain—Fiction
4. Caxley (England : Imaginary Place)—Fiction—20th century
5. 1
6. 17 min.

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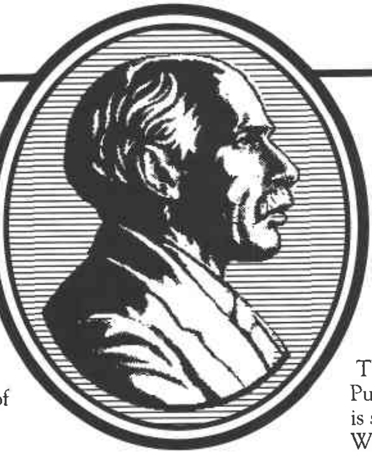

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Computer-Assisted Theory Building in Library Technical Services: Toward a General Theory of Cataloging Backlog Dynamics

Robert H. Burger

This paper examines the most frequently cited factors responsible for the formation of backlogs. Using these factors, a preliminary theory of backlog dynamics is described. Using computer-simulation software, these theoretical statements are modeled, and additional insights gained. The result is a preliminary theory of cataloging backlog dynamics based on computer simulation with suggestions on how to proceed with further testing and theorizing.

The word *backlog* has come to signify all that is wrong with current cataloging practice. Backlogs, or arrearages, as the more refined label them, are the result of not cataloging all catalogable materials that the library has acquired. The existence of backlogs, however, cannot be blamed entirely on cataloging practice but can also be ascribed to our inadequate understanding of the dynamics of the acquisitions and cataloging processes. Without this understanding we not only fail to avoid backlogs, but also are not prepared to eliminate them once they appear. This failure of understanding not only affects the internal operations of the library, but is a direct cause for reduced access to collections by patrons. One way of maximizing access to our collections and avoiding or eliminating backlogs is to rely on a generalized theory of backlog dynamics. Such a theory would enable us to understand the entire system that produces backlogs, the way elements of this system interact, and the relative weights given to each element of such a system.

Unfortunately, this general theory does not exist explicitly in the backlog literature. The elements of such a theory are often mentioned, but they have never been formulated into a coherent presentation. For example, in the now classic "Crisis in Cataloging" document by Andrew Osborn,[1] several reasons are given for the existence of the arrearage that existed at the Library of Congress, one that numbered 1,670,161

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volumes out of a total estimated collection of 5,800,000 volumes.[2] One reason was the method used by many catalogers, a method described by Osborn as "legalistic." Such a method was evidenced by a predilection for the recording of all minutiae relevant to the item being cataloged and an absolute reliance on an existing rule for every action taken. Osborn much preferred the "pragmatic" cataloger, who would use the rules as a guideline and interpret them and the item being cataloged with intelligence and experience. Osborn attributed the existing backlog in part to the practice of cataloging itself, i.e., the productivity of the catalogers.

In another classic article, George Piternick mentions several reasons for the existence of arrearages. The reasons he lists come from a survey he conducted in 1968 of university research libraries belonging to the Association of Research Libraries. In that survey the most frequently reported factor that caused backlogs was the absence of Library of Congress catalog copy for the item.[3] Without copy, he reasoned, individual libraries were unable to process quickly a sufficiently high percentage of their acquisitions in order to avoid the creation of or addition to backlogs. Here again, the backlog is attributed to inadequate cataloging productivity.

One final example will suffice. In 1984 Grace Agnew, Christina Landram, and Jane Richards conducted another survey of backlogs. They hypothesized that "cataloging arrearages would be a continuing problem for libraries because cataloging staff levels would not be adequate to handle both current and previous acquisitions."[4] Respondents to their survey cited the inadequate size and productivity of the staff to be the most important factor influencing the formation of backlogs. Other factors were also cited, including lack of staff expertise in certain languages, low productivity of staff, inflexibility of staff assignments, and uneven flow of acquisitions.[5] They concluded the analysis of their survey by stating that "the fundamental cause of arrearages is the disparity between acquisitions and the size and ability of cataloging staff."[6] These authors have done a service by expanding the number of variables that contribute to backlogs, citing acquisition of new material and the rate of acquisition as important factors.

Although some may argue that these surveys and studies have not yielded any insight not attainable through common sense, their value lies in the fact that they corroborated the commonsense analysis with observations in many different libraries. But such corroborated insights, as reassuring as they may be, do not really help us understand the dynamics of backlogs, nor do they really enable us to predict when a backlog will occur in a specific library or the magnitude of that backlog. For example, if we acquire three thousand more books this year than we did last year and our cataloging staff remains the same, does this mean that we will now have a backlog of three thousand volumes? Not necessarily. There are several reasons why such a prediction would be faulty. First, we do not have a comprehensive, general theory of backlogs and how they are formed. Because we lack this theory, we cannot use it to predict whether backlogs will occur in specific libraries. Second, upon examining the various causes for backlogs, we are unable to manipulate mentally all the variables involved to arrive at a confident prediction. There may have been changes in cataloging rules, other factors may have altered the productivity of the cataloging staff, or a larger percentage of the books this year may all have copy, whereas this was not true last year. Our hypothesis regarding the backlog in this case lacks predictive power. Third and finally, we would be confronting the problem as though the various rates of acquisition and cataloging did not affect the backlog substantially. The purpose of this paper is to formulate a general theory of backlog dynamics and to show how this theory can be applied and modified using computer-simulation software. The result will be a greatly enhanced understanding of backlog dynamics over time in the form of a preliminary theory of backlogs. This theory can then be empirically tested by other investigators. As with the simulation of any complex system, clarity obtained by a synthesizing theory is the first step to deeper understanding. Moreover, the method used to experiment computationally can be extended and applied in individual libraries.

CAUSES OF BACKLOGS

In examining the literature of backlogs the primary reason cited for forming a backlog is that the rate of acquisitions exceeds the rate of cataloging. In more precise parlance, in a given time period, if the number of items acquired exceeds the number of items cataloged, then a backlog will result. If the number of items acquired is less than the number of items cataloged, then excess cataloger time will result. Finally, if the number of items acquired equals the number of items cataloged, then no backlog and no idle cataloger time will occur.

We may represent this in the form of a quasi-mathematical model, however simple. Let RBklg stand for the rate of backlog growth (if positive) or diminution (if negative), RAcq represent the rate of acquisitions, and RCat represent the rate of cataloging. Then according to the description above

RAcq - RCat ==> RBklg (equation 1)

That is, the rate of backlog growth or dimunition is directly proportional to the rate of acquisitions (RAcq) minus the rate of cataloging (RCat). Although this is a straightforward, unambiguous statement, it demands closer scrutiny. First, the acquisitions rate can be increased because of the availability of new funds, the devaluation of foreign currencies in terms of the dollar, an increase in gift collections obtained, or the discovery of hitherto unknown backlogs. All these factors, as well as others, can contribute to increases in the rate of acquisitions. In more compact notation, the rate of acquisitions RAcq is a function of the funds available for purchasing materials Fnd, the relative value of those funds in all the markets where the library purchases books ValFnd, the size of the acquisitions staff and their productivity AcqStf, the demands and benefits of the technology available to carry out their work AcqTech, the number of gifts acquired Gft, and other unforeseeable influxes of material Oth, or

Fnd/ValFnd, Acqstf, AcqTech, Gft, Oth ==> RAcq (equation 2)

Similarly the cataloging rate RCat is dependent on several factors, not all of which are easily quantifiable. Factors that have been identified in the literature include the size of the cataloging staff and their productivity Catstf, the availability of copy cataloging for materials received Copavail, and the demands and benefits of the technology available CatTech, or

Catprod, Copavail, CatTech ==> RCat (equation 3)

Upon close examination, however, both of these formulations do not adequately identify all the factors or the way in which they interact. For example, Catprod can include several related factors such as the library's cataloging style—legalistic or pragmatic—the level of description, and psychological factors. We could continue to speculate on additional elements that can increase or decrease the rates of cataloging and acquisitions, but this would only serve to make our mental model of the process more complex and would decrease our limited mental ability to predict what would happen if any one of the factors were varied. Even with these limited factors, however, we can see that a quasi-mathematical model formed by substituting elements from equations 2 and 3 into equation 1 produces an already complex depiction of the process:

(Fnd/ValFnd, Acqstf, AcqTech, Gft, Oth), (Catprod, Copavail, CatTech) ==> RBklg (equation 4)

Furthermore, we have used commas to indicate that the units of measurement are by no means the same and the rate of growth or dimunition of the backlog cannot be predicted simply by adding up all the factors involved. The commas are simply used to show some interaction that is directly proportional or inversely proportional to the rate of growth or dimunition of the backlog.

In practice, I believe, we do not try to predict the likelihood of creating backlogs by increasing the number of factors involved. Instead, we try to simplify our model so that we can manipulate mentally those factors. For example, in order to decrease backlogs and affect the elements of the functions described above, several remedies for backlogs have been put forth. Practitioners have suggested increasing cataloging staff to keep up with acquisitions (a remedy rarely possible), restricting gifts accepted by the library, changing the styles and levels of cataloging, introducing new technologies that will increase cataloging productivity or increase the productivity of staff finding available copy, and other remedies. What is missing here, however, is a clear picture of the interaction of all the factors—in short, a model of the dynamics themselves. In addition, we have no idea of the relative weight accorded to each factor. Without such a generalized theory of how such a processing system works, it is difficult to seize on a reliable remedy for a specific library.

This problem is similar to that encountered in other disciplines when practitioners attempt to create a model of a dynamic system in order to predict the effects of changes in that system.[7] The number of variables is reduced in these models in order to predict the likely outcome of taking certain actions. What we need is a theoretical formulation of backlog dynamics that goes beyond the haphazard and impressionistic conceptualization of the problem that the present literature affords. One way of creating such a formulation is to use computer-simulation software to model library processing dynamics. The use of such software, particularly the Stella for Education program, enables the practitioner to gain insights into the processes over which control must be exercised. These insights can then be used to modify our theory, to retest our model using empirical data from our own libraries, and finally to take appropriate actions based on the outcome of these simulated experiments.

The use of such software alone, however, is not sufficient to create a robust model capable of reliably predicting the effects of suggested remedies. In addition to the simulation tools, we need to formulate a mathematically based theory of production that can be refined with additional research. Such a theory would describe the most significant factors involved in the production of cataloging and the results obtained by altering the mix of these various factors. This may be significant on several counts. For example, one of the remedies suggested now for alleviating the backlog problem is the increase of staff. But this suggestion, to my knowledge, has never been tempered with the caveat that each marginal increase in staff may not increase the amount of cataloging produced by the previous marginal increase in staff. This phenomenon, known in economics as the law of diminishing marginal returns, may well be operative in cataloging production.

To develop such a theory is a tall order indeed, much too tall to encompass in an article-length paper. What is proposed here is not to develop such a theory in its entirety, but to move toward a theory of backlog dynamics. To accomplish this, this paper will take a very simple model of backlog dynamics, describe it thoroughly, state assumptions, and then increase the complexity of the model in three different ways. This will be done not to state the final word on backlog dynamics, but to demonstrate how simplistic our current knowledge of these phenomena are and to suggest a way of enriching and expanding this knowledge. Each of the models presented on the following pages is a simulation of equation 1, the simple backlog model. The reader will see how such a simple equation can hide important complexities that must be recognized in order to deal practically with backlogs.

SIMPLE BACKLOG MODELS

Let us first examine a simple backlog model. In this model the acquisition rate is 1,000 per month and the cataloging rate is 1,000 per month. The backlog already has 370 books in it.[8] Figure 1 represents the results of these conditions over twenty-five months, an outcome that we can predict easily and accurately. If the amount cata-

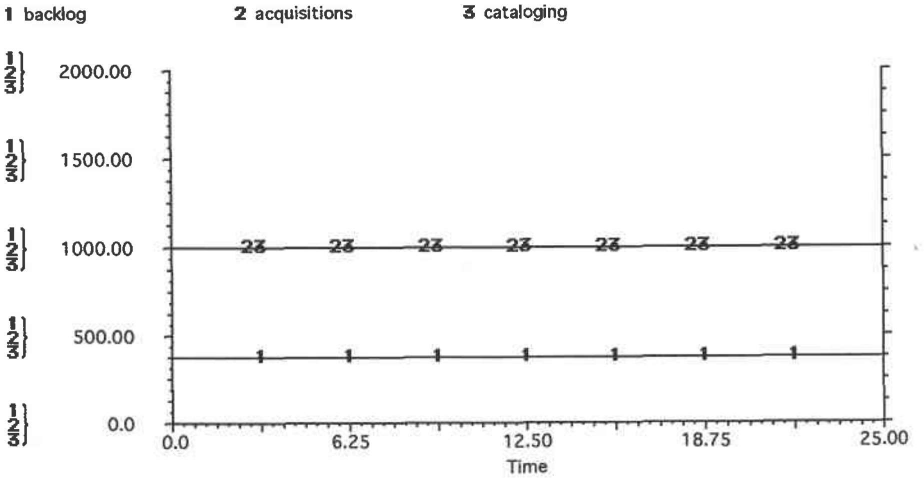

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Figure 1. Stable Backlog.

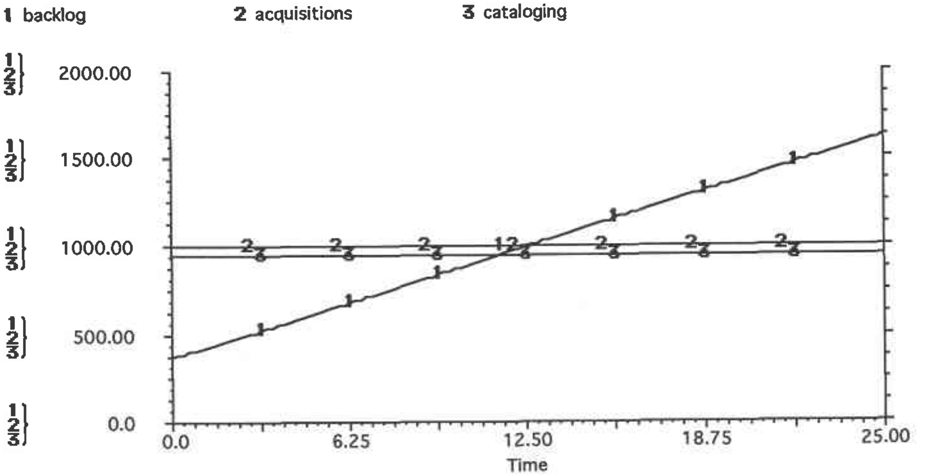

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Figure 2. Increasing Backlog.

loged equals the amount received the backlog will remain stable over time.

If the cataloging rate is only 95% (950 per month) of the acquisition rate, however, in twenty-five months there will be a backlog of 1,620 books (see figure 2). This represents a relatively small margin of difference between books cataloged and books acquired. With this shortfall, however, over two years our library will have created a backlog that will take one cataloger over a year to eliminate.[9]

In both of these models there are several assumptions that we should state. First, books are acquired here at a uniform rate; second, books are cataloged at a uniform rate; and third, we have ignored the differences between copy and original cataloging. There are several advantages to such a model. First, it helps us to understand the basics of backlog dynamics. We may even assert that this type of model is implicit in the existing literature, with some minor modifications. Second, the model is more like what we would prefer to happen than the reality that actually faces us. Third, there are a limited number of variables with which to be concerned. Fourth, there is communication and evaluation at some level in the library about the monthly rate of acquisitions, the monthly rate of cataloging, and a monthly computation of the size of the backlog. Finally, predictions about suggested remedies are uncomplicated and straightforward, albeit simplistic.

This type of model also has its disadvantages, however. First, even though we know better, we often envision our actual dynamic systems as though they were the simple model portrayed here because of the difficulty inherent in visualizing or creating more complex models. Second (and this was previously stated as an advantage), predictions of our complex system are based on a simple system that does not precisely resemble reality, so our predictions of the results of enacting suggested remedies are inaccurate. We are doing thought experiments with a mental model that roughly resembles reality. The more precisely we define the variables in the system, the more closely our artificial system will resemble reality. We should always be mindful, however, that although we may predict outcomes in our program, we do not have this ability in reality. In part our experiments give us confidence that our actions in the real world are the best and most informed that we can carry out. They are, however, no guarantee of success.

Of course, in the library modeled here we would be monitoring the monthly accumulation of backlogged materials and would have done something, if possible, prior to the twenty-five month accumulation of 1,620 books. In reality, I would contend that monthly cataloging statistics are often collected, while monthly acquisitions rates and backlog size are not. The first is often used for evaluation of catalogers; the others are not. So even though we possess a simple mental model of backlog dynamics, many librarians neglect to put it to use, lacking as they do the monthly benchmarks required for monitoring.

BACKLOG MODELS OF INCREASING COMPLEXITY

Let us move to a slightly more complicated model. In this one we will try to simulate reality more closely by having a varying acquisition rate with a stable cataloging rate. First, however, perform a thought experiment. Let us say that our cataloging rate will remain the same over twenty-five months, but that because of the book trade and other factors, we will not receive a steady flow of acquisitions, but the amount received each month will not exceed our base rate of 1,000 books per month by more than 25%. That is, we will not receive more than 1,250 nor less than 750 per month. What effect would this have on the backlog after twenty-five months? Although it is difficult to determine this, the effect over this period can be easily modeled with the Stella for Education software. In figure 3 we have a model of a system with fluctuating inputs of 25% over the base. Our cataloging rate is stable during this period. Again, our backlog starts out at 370 books.

In this simulation,[10] we cannot speculate that a varying acquisitions rate produces, over a twenty-five month period, a reduction in the backlog. Backlog size depends, however, on the acquisitions rate and the length of time it exceeds and is less than the cataloging rate. Our theoretical statement, presented above in equation 4, holds true but does not help us to determine what the effects will be for a specific library. If data from a specific library were simulated here, we would at least know that we would have to provide for additional space and shelving over this period for the backlog, as well as additional staff time for managing the backlog. We would also know that our catalogers would not run out of books to catalog during the period, even with reduced acquisitions periods. An experienced cataloging depart-

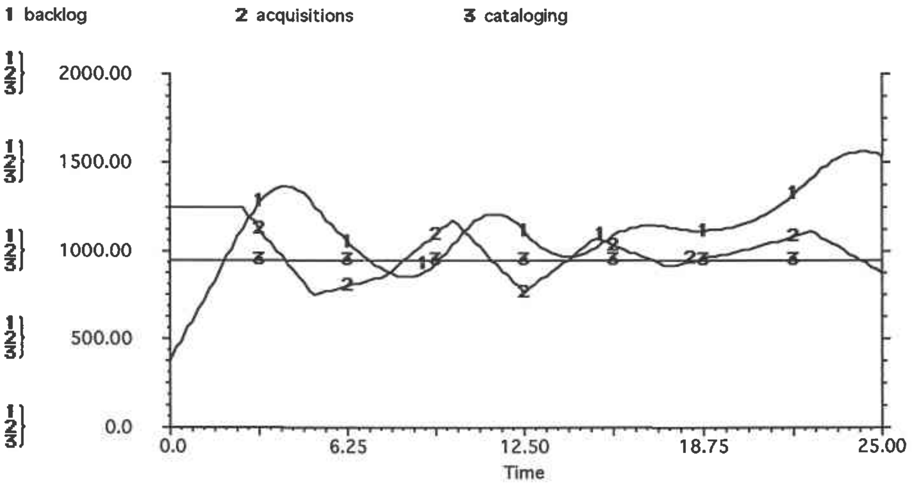

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Figure 3. Fluctuating Acquisitions Rate.

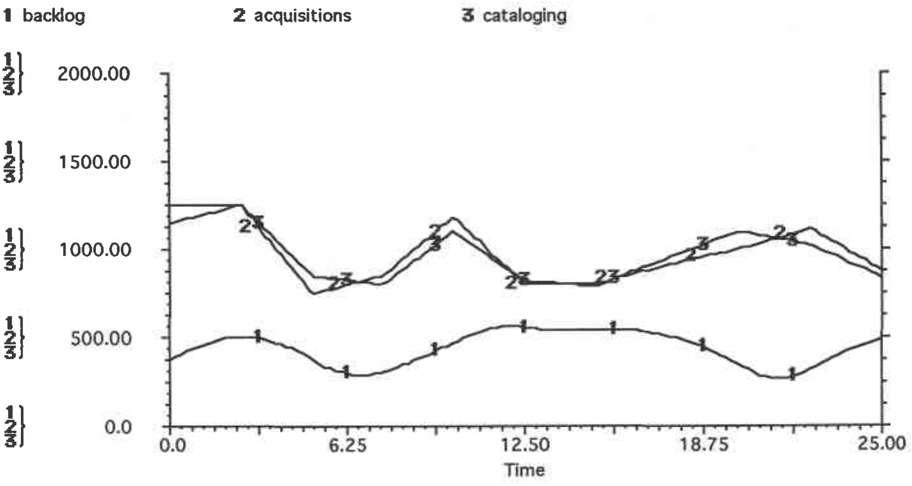

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Figure 4. Acquisitions and Cataloging Rates Varying 25% Either Way but in Cycle.

ment head, however, could still argue that such results could have been obtained through common sense. Perhaps. In the next simulation, let us move a little closer to reality by varying both the acquisitions and cataloging rates by 25% either way, but in cycle with one another (see figure 4). That is, when the acquisitions rate goes down, the cataloging rate will also go down. When one goes up, so will the other. This is a simple covariance and should not be confused with one "causing" the other. If we did a thought experiment prior to our simulation, what would you predict the size of the backlog to be after the twenty-five month period?

Many who performed the presimulation thought experiment would probably predict such an outcome as pictured here. Because the rates covary in cycle and magnitude, the backlog would probably not vary much. With the data used, the curve

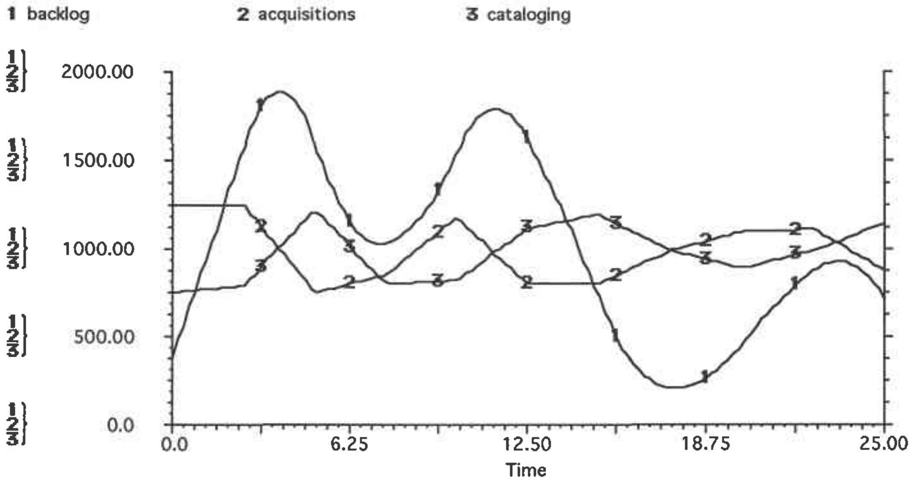

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Figure 5. Acquisitions and Cataloging Rates Varying 25% Maximum Either Way but out of Cycle.

for the backlog does gradually increase, but this may be a function of the specific data used here. We could test this hypothesis in Stella by using different data sets for acquisitions and cataloging to see whether the backlog curve behaved differently under different conditions. We will not do this experimentation here but instead simply point out that if a librarian had historical data, and assumed that historical patterns would continue into the future, then this simulation would provide, at the very least, some planning information for backlog management. Monitoring of the cataloging rate and the acquisition rate would ensure that there would be no surprises at the end of the prediction period. If patterns appeared to change, the projected rates could be altered and another simulation run to see what would happen.

As a final illustration of this technique, let us alter the thought experiment from the previous one by having the cataloging and acquisitions rates vary out of cycle (see figure 5). What would the outcome be?

In this figure, the varying rates of cataloging and acquisitions do not, as many might suppose, cancel each other out over the long run. Instead, for the data used here, we have two significant results. First, the backlog size varies to a far greater extent than it did in our previous simulation, where the rates varied in cycle. Second, by the end of the period we have not eliminated our backlog. These two simulated outcomes would have implications for technical services. First, the backlog management problem would be immense. Second, what would the catalogers do when there were not enough books to catalog? If the cataloging department head could foresee this, then plans could be made for wise use of staff.

CONCLUSION

Up to the present time, theory concerning cataloging backlogs has been implicit in the literature, but never explicitly stated with any precision or in quasi-mathematical language. The formulation given in equation 4,

(Fnd/ValFnd, Acqstf, AcqTech, Gft, Oth),
(Catprod, Copavail, CatTech) ==> RBklg

is a good starting point for the formulation of a theory of cataloging backlogs. Further study, however, is needed in order to refine this theory. I have shown how the use of computer-simulation software can help us in this process. For example, from the equation given here, nothing is said about the cyclicality of variation of the acquisition factors and the cataloging factors. Our computer-generated experiments have suggested that this could play an important role in the variation of the backlog itself. We also need further study in what has been called sensitivity analysis, i.e., which variables or relationships are most consequential for determining behavior of a dependent variable over time. Other questions also arise. For example, with Stella for Education software we could determine what cataloging rate (productivity, technology, etc.) is needed to eliminate the backlog or to keep it stable within a projected time period. We could also refine our simulated variables to include production rates for copy cataloging and original cataloging and see what effect these have on acquisitions that have known availability of copy.

Moreover, this exercise suggests that coordination of acquisitions and cataloging is necessary in order to provide the most access to the materials we have already acquired. More frequent monitoring of acquisitions and cataloging rates is also warranted. Above all, however, in using such simulation software, we must not forget that activities simulated on a computer do not always reflect reality as closely as we might wish. With a computer we can control the variables, manipulate them at will, and meet goals we set. For future research, investigators can explore several avenues. For example they can:

1. conduct empirical studies to support or alter the theoretical formulations described in one or more of the equations;
2. conduct further computer simulations as practiced here with other variables from equations 2-4 incorporated;
3. carry out sensitivity analysis to determine what factors are more determinant in creating backlogs; this could also be carried out with computer simulation;
4. explore different ways of maximizing resources to reduce wide fluctuations in backlog size.

Librarians have failed to understand adequately the dynamics and complexities underlying backlogs. Further empirical and theoretical research, based on the theories and models presented here, have the promise of giving us a greater and deeper understanding of cataloging backlogs.

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7. For an excellent introduction to the use of computers in modeling see Robert A. Hanneman, *Computer-Assisted Theory Building: Modeling Dynamic Social Systems* (Beverly Hills, Calif.: Sage Publications, 1988).
8. I have made the backlog stable at 370 books so that other graphs in this article will all have the same beginning backlog and presentation of them will be uniform.
9. This assumes that a cataloger catalogs approximately 100 titles per month, on the average. The figures given here are for illustrative purposes only.
10. Stella uses Euler's computation method in these examples.

Notes on Operations

Technical Processing of Electronic Journals

Gail McMillan

Electronic journals portend tremendous advantages to libraries. Patron access is swift and sure; these journals are never missing from the shelves, and they need not be delayed for technical processing because they can be "sent" to public display and serials maintenance almost simultaneously. However, how will library users know what journals are available to them? They should be able to find electronic journals through the same means they find information in all other formats—through libraries' online catalogs. The phrase "mark it and park it" has not lost its relevance in the virtual library environment.

The potential value of electronic journals is tremendous, especially in terms of timely document delivery, direct links from online catalogs, and greatly reduced subscription prices (when there is any charge at all). Of course, they also raise new questions. Can a library provide access? What is the role of technical services in light of this newest format? The electronic journal is another technological advancement to be incorporated into the information sources of the library.

Libraries and their catalogs must continue to provide access to publications in new formats, including electronic journals, for the same reasons they provide access to library materials in existing formats. In a recent article about electronic information and technical services functions, Peter Graham asked, "Mark it and park it? Mark what, and park it where?"[1] Although he perhaps makes these sound like silly questions, they are still valid issues for libraries, patrons, and readers of electronic publications. The online catalog can continue to be the best integrated source of information to lead readers to the vast resources available to them. Therefore, libraries should also make electronic journals available and provide access through their catalogs.

At Virginia Polytechnic Institute and State University our approach was to look at what actions we could take to provide the community we serve with access to electronic journals in the near future. In October 1990, the university librarian appointed seven faculty and staff to the Task Force on the Electronic Journal. They represented each of the principal areas that would be responsible for processing and handling electronic publications. From the beginning this group was enthusiastic

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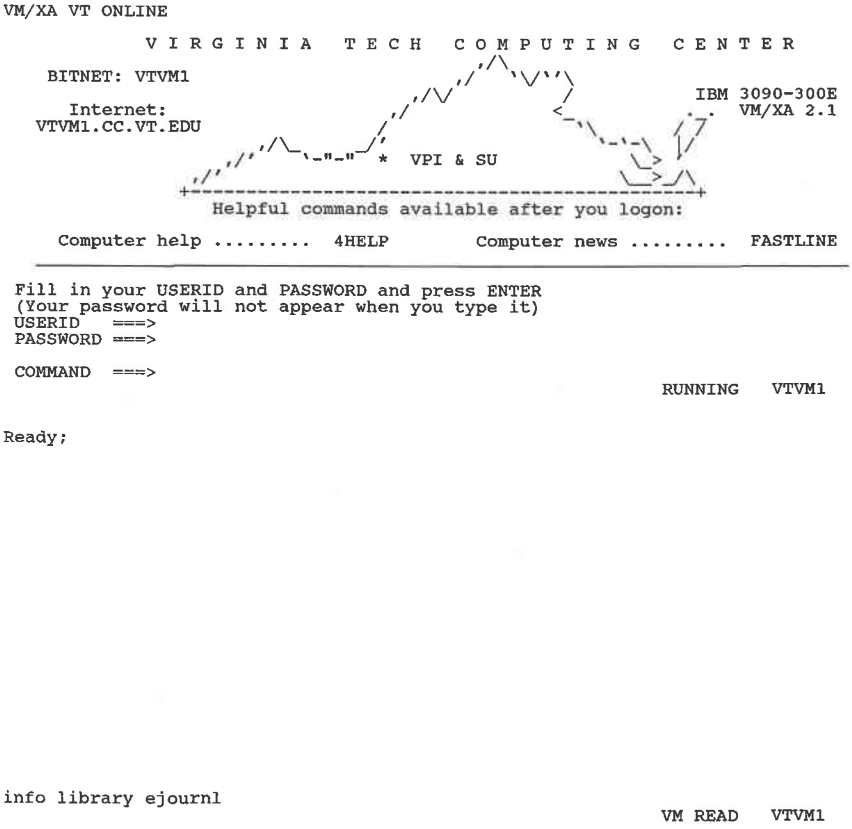
about its charge to investigate and recommend ways in which the library could integrate electronic journals into its processes and procedures. Within six months the task force completed its report. The task force continued as the implementation team, and two months later electronic journals were available to our user community.

Although it considered several practical options, the task force decided storage and access of the full text of electronic journals would have to be on the university's mainframe computer, an IBM 3090-300E, called VM for Virtual Machine. It was accessible immediately, had enough disk space, and was available through local and wide-area networks. Every phone outlet on campus also links office and dormitory personal computers and workstations to the university mainframe. Many VM users routinely transfer, download, and print files. VM uses the CMS Help System, which has a component called INFO, or University Information, that the libraries have been using to provide campuswide information about university libraries for several years.

Following logon, VM users enter the string of commands INFO LIBRARY E-JOURNL, or they choose the appropriate sequence of screens and menu selections (see figure 1). These commands lead VM users to a list of titles of available electronic journals. While the task force designed mainframe computer access to electronic journals, it also addressed bibliographic control and internal library technical processing issues. As the task force report



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VM/XA VT ONLINE

             V I R G I N I A   T E C H   C O M P U T I N G   C E N T E R
                                            ,/\
    BITNET: VTVM1                         ,/'   '\/''\
                                     ,/\/'           /                IBM 3090-300E
      Internet:                    ,/               <_               . .  VM/XA 2.1
   VTVM1.CC.VT.EDU                /                   '\           / 7
                        ,/\_  '-"-"_/'                   '-'-\     |/
                     ,/'                 *  VPI & SU          \_>  '
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                 +--------------------------------------------------+
                   Helpful commands available after you logon:

     Computer help .........  4HELP       Computer news .........  FASTLINE
   ___________________________________________________________________________

  Fill in your USERID and PASSWORD and press ENTER
  (Your password will not appear when you type it)
  USERID   ===>
  PASSWORD ===>

  COMMAND  ===>
                                                             RUNNING   VTVM1

Ready;




info library ejournl
                                                             VM READ   VTVM1
```

Figure 1. Enter One String of Commands at Logon to Access E-Journals on VM1.

TABLE 1

ELECTRONIC JOURNALS AVAILABLE THROUGH UNIVERSITY LIBRARIES: THE ORIGINAL FIVE TITLES

Electronic Journals	OCLC no.	BITnet	Internet
Electronic Journal of Communication	23849985	comserv @ rpiecs	winter @ ucc.uwindsor.ca*
Journal of the International Academy of Hospitality Research	22332842	jiahred @ vtvm1	jiahred @ vtvm1.cc.vt.edu
New Horizons in Adult Education	23865312	eastmond @ suvm*	
Postmodern Culture	22471982	pmc @ ncsuvm	pmc @ ncsuvm.ncsu.edu
Public Access Computer Systems Review	20987125	pacs-l @ uhupm1	

*Editor

TABLE 2

THREE JOURNALS ADDED TO FURTHER TEST THE TASK FORCE RECOMMENDATIONS

Electronic Journals	OCLC no.	BITnet	Internet
Community Services Catalyst	3334057	listserv @ vtvm1	listserv @ vtvm1.cc.vt.edu
Newsletter on Serials Pricing Issues	20386539	tuttle @ unc*	
Psycoloquy	23056090	listserv at pucc	listserv @ pucc.princeton.edu

*Editor

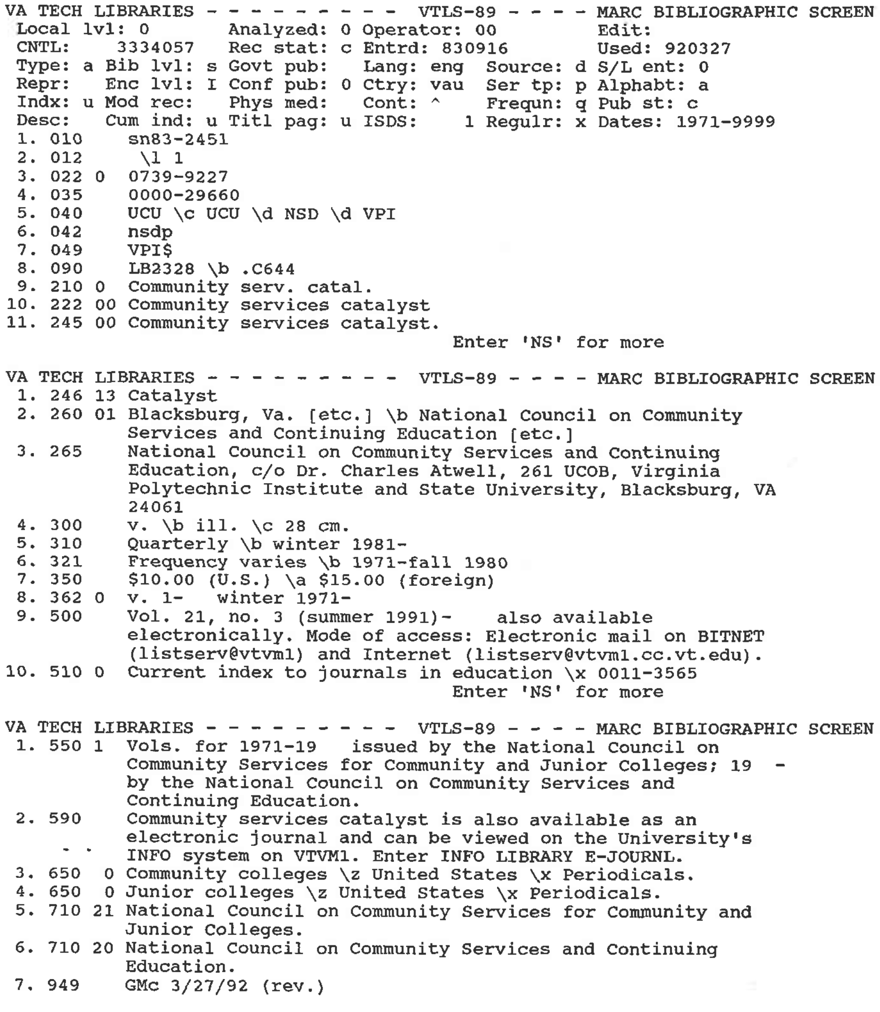
states, "electronic journals can be processed via procedures analogous to those [that] govern the processing of printed serials."[2]

At the outset of electronic journal testing, five different journal subscriptions were acquired (see table 1). The task force found that requesting a subscription to an electronic journal and receiving and processing an issue are very similar to sending and receiving notes and files as electronic mail and participating in listservs. As issues arrived, files were forwarded to the programmer who implemented the E-JOURNL option on the mainframe.

One of the early decisions the task force made was that there would be three separate stages of processing and each of these would require a separate user identification and VM account. EJACQ is the user ID established for the acquisitions department to send requests for subscriptions to electronic journals and to receive issues for check-in. EJCAT is the user ID through which the serials cataloging and maintenance team receives issues to catalog as new titles and performs the ongoing maintenance that all serials require. EJPOST is the user ID for the public display, which we refer to as "posting" to the INFO system. At each stage of processing, files that have been forwarded are not discarded from that filelist until the person sending the file has received notification from the person who is maintaining the files for the receiving user ID that the text transferred successfully.

The task force initially selected five electronic journals to use in testing each phase of processing; they later agreed to add three more titles (see table 2). These titles covered various subject areas, and they provided the opportunity to work with serials both with and without tables of contents, a challenge when it comes to consistent presentation in public displays. These serials also provide experience processing issues available in single and multiple files and with active and passive receipt patterns.

The Journal of the International Academy of Hospitality Research is published by the Scholarly Communications Project, which became a unit of the university libraries in July 1991. *Community Services Catalyst* is another but more recent publication of the Scholarly Communications Project. It is our first journal available both as hard copy and as an electronic publication. The electronic version of *Catalyst* has not been cataloged separately. The bibliographic record for *Catalyst* has general and local notes specifically about the additional electronic version and online access (see figure 2).

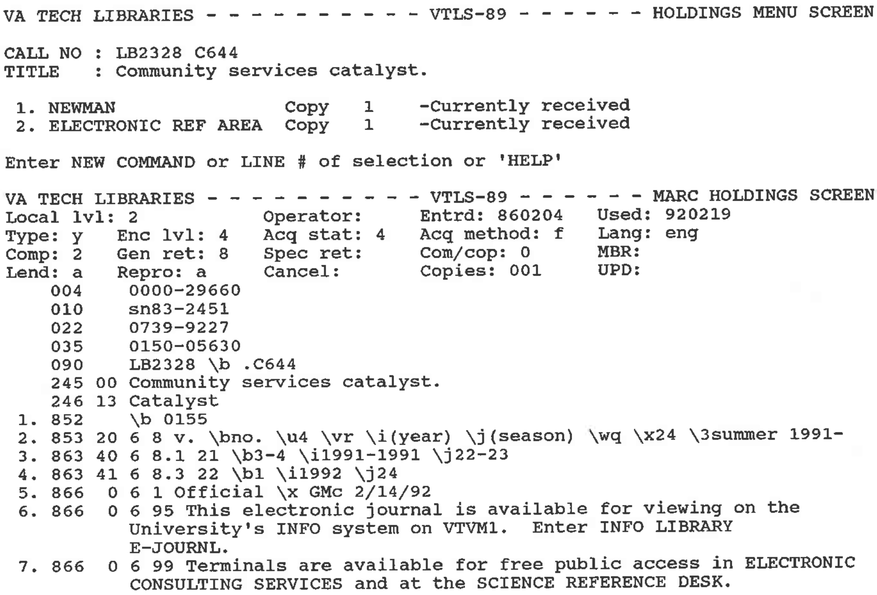


```
VA TECH LIBRARIES - - - - - - - - -  VTLS-89 - - - - MARC BIBLIOGRAPHIC SCREEN
 Local lvl: 0       Analyzed: 0 Operator: 00         Edit:
 CNTL:    3334057   Rec stat: c Entrd: 830916        Used: 920327
 Type: a Bib lvl: s Govt pub:   Lang: eng  Source: d S/L ent: 0
 Repr:   Enc lvl: I Conf pub: 0 Ctry: vau  Ser tp: p Alphabt: a
 Indx: u Mod rec:   Phys med:   Cont: ^    Frequn: q Pub st: c
 Desc:   Cum ind: u Titl pag: u ISDS:    1 Regulr: x Dates: 1971-9999
 1. 010    sn83-2451
 2. 012     \l 1
 3. 022 0  0739-9227
 4. 035    0000-29660
 5. 040    UCU \c UCU \d NSD \d VPI
 6. 042    nsdp
 7. 049    VPI$
 8. 090    LB2328 \b .C644
 9. 210 0  Community serv. catal.
10. 222 00 Community services catalyst
11. 245 00 Community services catalyst.
                                        Enter 'NS' for more

VA TECH LIBRARIES - - - - - - - - -  VTLS-89 - - - - MARC BIBLIOGRAPHIC SCREEN
 1. 246 13 Catalyst
 2. 260 01 Blacksburg, Va. [etc.] \b National Council on Community
           Services and Continuing Education [etc.]
 3. 265    National Council on Community Services and Continuing
           Education, c/o Dr. Charles Atwell, 261 UCOB, Virginia
           Polytechnic Institute and State University, Blacksburg, VA
           24061
 4. 300    v. \b ill. \c 28 cm.
 5. 310    Quarterly \b winter 1981-
 6. 321    Frequency varies \b 1971-fall 1980
 7. 350    $10.00 (U.S.) \a $15.00 (foreign)
 8. 362 0  v. 1-   winter 1971-
 9. 500    Vol. 21, no. 3 (summer 1991)-   also available
           electronically. Mode of access: Electronic mail on BITNET
           (listserv@vtvm1) and Internet (listserv@vtvm1.cc.vt.edu).
10. 510 0  Current index to journals in education \x 0011-3565
                                        Enter 'NS' for more

VA TECH LIBRARIES - - - - - - - - -  VTLS-89 - - - - MARC BIBLIOGRAPHIC SCREEN
 1. 550 1  Vols. for 1971-19   issued by the National Council on
           Community Services for Community and Junior Colleges; 19  -
           by the National Council on Community Services and
           Continuing Education.
 2. 590    Community services catalyst is also available as an
           electronic journal and can be viewed on the University's
           INFO system on VTVM1. Enter INFO LIBRARY E-JOURNL.
 3. 650  0 Community colleges \z United States \x Periodicals.
 4. 650  0 Junior colleges \z United States \x Periodicals.
 5. 710 21 National Council on Community Services for Community and
           Junior Colleges.
 6. 710 20 National Council on Community Services and Continuing
           Education.
 7. 949    GMc 3/27/92 (rev.)
```

Figure 2. MARC Bibliographic Record for the E-Journal *Community Services Catalyst.*



```
VA TECH LIBRARIES - - - - - - - - - - - VTLS-89 - - - - - - HOLDINGS MENU SCREEN

CALL NO : LB2328 C644
TITLE   : Community services catalyst.

 1. NEWMAN                 Copy   1    -Currently received
 2. ELECTRONIC REF AREA    Copy   1    -Currently received

Enter NEW COMMAND or LINE # of selection or 'HELP'

VA TECH LIBRARIES - - - - - - - - - - - VTLS-89 - - - - - - MARC HOLDINGS SCREEN
Local lvl: 2           Operator:      Entrd: 860204    Used: 920219
Type: y   Enc lvl: 4   Acq stat: 4    Acq method: f    Lang: eng
Comp: 2   Gen ret: 8   Spec ret:      Com/cop: 0       MBR:
Lend: a   Repro: a     Cancel:        Copies: 001      UPD:
    004     0000-29660
    010     sn83-2451
    022     0739-9227
    035     0150-05630
    090     LB2328 \b .C644
    245 00 Community services catalyst.
    246 13 Catalyst
 1. 852     \b 0155
 2. 853 20 6 8 v. \bno. \u4 \vr \i(year) \j(season) \wq \x24 \3summer 1991-
 3. 863 40 6 8.1 21 \b3-4 \i1991-1991 \j22-23
 4. 863 41 6 8.3 22 \b1 \i1992 \j24
 5. 866  0 6 1 Official \x GMc 2/14/92
 6. 866  0 6 95 This electronic journal is available for viewing on the
           University's INFO system on VTVM1.  Enter INFO LIBRARY
           E-JOURNL.
 7. 866  0 6 99 Terminals are available for free public access in ELECTRONIC
           CONSULTING SERVICES and at the SCIENCE REFERENCE DESK.
```

Figure 3. VTLS Holdings Menu and MARC Holdings for *Catalyst.*

Catalyst has two separate holdings records: one for the hard copy and one for the electronic journal holdings. It is our policy to create detailed, copy-specific MARC holdings records for all serials; electronic journals are no exception (see figure 3).

SUBSCRIBING

To test the technical processing of these electronic journals, I logged on as the ordering clerk will with the acquisitions user ID EJACQ. I addressed an electronic mail (e-mail) message either to a real person, usually the editor, or to the computerized listserv handling the journal's mailing list. In the case of *Psycoloquy*, for example, I sent a machine-readable command to the e-mail address with one line of text: "subscribe *Psycoloquy* Virginia Tech Libraries." Almost immediately I received notes telling me Virginia Tech Libraries had been added to the list of subscribers. In the case of other electronic journals, including *New Horizons in Adult Education, Newsletter on Serials Pricing Issues,* and the *Journal of the International Academy of Hospitality Research*, I wrote to the editors at their electronic mail addresses and in normal English requested a subscription to their electronic journals. They also responded by e-mail, though not as quickly, telling me the university libraries had been added to their list of subscribers.

Once the request has been made, there are two typical receipt patterns for issues of electronic journals. In the case of the *Journal of the International Academy for Hospitality Research*, for example, issues are distributed electronically to each subscriber. Receipt is a passive activity for the library once its account has been established; passive in that the full text of each issue is sent to the e-mail address of each subscriber, whether an individual or a library. Files of new issues arrive in the EJACQ temporary holding file called "readerlist," and with the push of a function key, it is "received"—that is, moved from the readerlist to the filelist.

A second receipt pattern requires more proactive procedures on the part of subscribers. For some electronic journals, such as the *Electronic Journal of Communication,* subscribers receive e-mail notification when another issue is available, but each new issue is not automatically sent. With this receipt pattern, once a subscriber receives notification that an issue is available, the subscriber must send a machine-readable e-mail message to receive it. Typically, subscribers must separately retrieve the table of contents which lists the articles in the issue and usually includes instructions on how to receive each article. The message is formulated as: get [author's name] [volume and issue number]. For example, send the message "get marinot v2n191" to retrieve Steve Marinot's article published in the *Electronic Journal of Communication*, volume 2, number 1 (December 1991).

For some online journals, such as *Psycoloquy* and *Public Access Computer System Review*, it is also possible to retrieve an entire issue as a package, rather than having to request each article in an issue as a separate file. The machine-readable command is "Get [journal title] [issue designation] package." For example, to receive the entire first issue of *Postmodern Culture* as a file, the e-mail message would be limited to "get pmcv1n1 package."

Whether or not the machine-readable command to get an entire issue as a package is used, each article arrives as a separate file. Frequently issues of electronic journals have to be sent as multiple smaller files rather than in a single file because the issue is too large to transmit electronically as just one very large file.

Whenever issues of an electronic journal are available, the task force recommended that the serials receiving staff get or receive all the files associated with an issue. They are not asked to be selective and receive partial issues. It will be necessary for someone in the serials receiving unit to check the EJACQ readerlist at least weekly for receipt of new issues. Weekly is as long as the system allows a file to remain unopened in the readerlist before it is automatically deleted.

In addition to receiving or bringing each issue into the acquisitions filelist, the check-in clerk should give each file a cursory check to make sure that basic conventions of text storage have been maintained and that the text is truly readable. Sometimes files in the readerlist initially appear to be garbled; the receive command that moves the files into the filelist reformats the files into easily readable documents.

CHECK-IN AND CLAIMING

The check-in for electronic journals follows the same procedures as those for serials with standing orders in all other formats. Serials receiving staff incorporate the same "remind" functions now used for online check-in of serials in all other formats. That is, when expected issues are not received, the Virginia Tech Library System (VTLS), the university libraries' online catalog, reminds them to verify that an issue has not yet been sent. Claiming procedures may be somewhat easier than claiming standing orders in other formats because of more direct online access and standard computer commands like the "get" command mentioned earlier to retrieve an issue. The Task Force on the Electronic Journal recommended that serials receiving staff calculate claims by the same means now used for journals in other formats, but of course, irregular frequencies for any journal make claiming and predicting an added challenge. These checks and procedures will more fully evolve as the serials receiving staff becomes familiar with processing electronic journals for online check-in, reminds, and claiming.

It is not necessary to make printouts to use when updating VTLS for check-in and holdings records. It is possible to toggle between e-mail on the university mainframe, any screen on VTLS, and the OCLC Online Computer Library Center database of bibliographic records. It should be as accurate as looking from printout to screen display as toggling between screen displays to verify accurate data entry. For the same reasons, reviewing a new clerk's work could be done online without printouts.

Added issues are checked in online and the MARC holdings record updated at the time of online check-in. VTLS MARC holdings records list in full detail all issues of each title of each electronic journal available online, just as do the holdings

This electronic journal is available for viewing on the University's INFO system on VTVM1. Enter INFO LIBRARY E-JOURNL.

Terminals are available for free public access in ELECTRONIC CONSULTING SERVICES and at the SCIENCE REFERENCE DESK.

Figure 4. Notes for All Holdings Records of Electronic Journals.

records for serials in other formats. These screens also explicitly direct VTLS users to the sources of the text of the electronic journals and identify the sites of dedicated access terminals. This information appears in free-text notes (MARC tag 866, indicators ƀ 0) (see figure 4).

CATALOGING

As with serials in other formats and from other sources, the serials receiving unit will electronically forward to EJCAT, the serials cataloging and maintenance team's user ID, an electronic journal when there has been a change in title, a special issue has been received, or there is some other reason the bibibliographic record needs maintenance. An e-mail note could accompany the file of the journal with the information that is currently written on a "continuation transmittal slip" and attached to the physical pieces of serials in other formats. Electronic journals receive full cataloging treatment, following standards presented in the CONSER guidelines,[3] just as do serials in other formats cataloged at Virginia Tech. All serials receive Library of Congress (LC) Classification numbers and subject headings, linking entries, name authority work, and more. By assigning standard LC Classifications, VTLS users browsing in a familiar classification number range encounter electronic journals along with other serials and monographic materials classed similarly. We "mark it and park it" because the libraries' online catalog is the best single place for the scholars and stu-

500 Mode of Access: Electronic mail on BITNET ([user-ID] @ [nodename]) and Internet ([user-ID] @ [nodename]).

Example from *The Journal of the International Academy of Hospitality Research:*

Mode of Access: Electronic mail on BITNET (JIAHRED @ VTVM1) and Internet (JIAHRED @ VTVM1.CC.VT.EDU).

590 This electronic journal is available for viewing on the University's INFO system on VTVM1. Enter INFO LIBRARY E-JOURNL.

Figure 5. Notes for Bibliographic Records of Electronic Journals.

dents at Virginia Tech to find out what their options for information resources are. Traditional cataloging forms the foundation for effective information retrieval.

The bibliographic record also describes the means of access because VTLS does not provide a direct link to the full text of electronic journals. The bibliographic record describes two means of accessing electronic journals, a general note (MARC tag 500) and a local note (MARC tag 590) (see figure 5).

One overwhelming advantage electronic journals have over all other formats is that issues can be sent practically simultaneously to both the serials cataloging and maintenance team and the INFO system for public display. With electronic journals, the public access to any issue will no longer be delayed for technical processing because the bibliographic or holdings records need updating.

Each electronic journal is currently available to the university libraries without a fee, so procedures for processing subscription costs and other considerations important to the business services department may not be fully developed. However, in consultation with this unit of the libraries, neither the task force nor the staff involved anticipated any problems. Receipt of the new electronic journal jointly published by OCLC and the American Association for the Advancement of Science, *The Online Journal of Current Clinical Trials*, may provoke the university libraries again to analyze payment procedures at least for this, if not other, electronic journals.

CONCLUSION

Electronic journals have tremendous potential, and although most of them are available without subscription fees, "there's no such thing as a free lunch." Like all library materials, whether received as a gift or paid from the materials budget, electronic journals are costly for libraries in terms of staff time, equipment, and computer processing. However, not everyone has a personal computer or is able to access the library's or university's mainframe. Those who do may not want to fill their disks, hard drives, or files. What if their computers malfunction or the electricity is off in their homes or offices? These are new considerations, but libraries should provide access to information in whatever formats are available. Right now at Virginia Tech that means providing information about electronic journals included in the libraries' online catalog through access to the issues stored in the university's mainframe computer. Since the Virginia Tech task force report was drafted, several others have also circulated reports including Massachusetts Institute of Technology and Fort Hays State University.

The Tech Task Force on the Electronic Journal's report concludes: "We feel strongly that local storage and access of full text electronic journals is a major step in the migration towards the concept of 'access and ownership.' The handling of electronic journals has important implications for future use of full text document delivery in fulfillment of the goals of the university libraries."[4] Electronic journals deserve a place in library collections, and the basic technical processes provide the necessary access to information for library users.

REFERENCES

1. Peter S. Graham, "Electronic Information and Research Library Technical Services," *College & Research Libraries*, 51:243 (1990).
2. "Report of the Task Force on the Electronic Journal," University Libraries, Virginia Polytechnic Institute and State University, April 21, 1991. The report was revised for distribution May 17, 1991; p.7.
3. *CONSER Editing Guide* (Washington, D.C.: Serial Record Division, Library of Congress, 1986).
4. "Report of the Task Force," p.10.

Compromises in the Management of Working Papers

Aline Soules, Jane Lucas, and Susan Pritts

Working papers provide a critical vehicle for access to the cutting edge of research, yet many libraries offer highly limited access to working papers or do not provide access at all. One reason is a lack of resources to carry out the selection, acquisition, cataloging, and processing of these nontraditional materials. Another is the belief that if the research described in the working paper is of value, it will eventually appear in a more formal publication. At the Kresge Business Administration Library, working papers are provided as an essential service because our clients believe access to them is important for their current research. In order to manage them with limited resources, compromises were made.

The Kresge Business Administration Library primarily serves the faculty, students, and staff of the School of Business Administration to which it reports. The larger campus and other users access the library but are not considered primary. Results of surveys of the primary clientele have emphasized the importance of working papers to their work, and the library offers access to them within the constraints of staff time and fiscal resources.

HISTORY

In the mid-1970s working papers from institutions other than the University of Michigan were received in the School of Business Administration's Division of Research (DOR) and forwarded to the library. The division itself published the school's own papers and sent them on request to other institutions on an exchange basis. Gradually, an informal network and mailing list were established, with the library becoming the beneficiary of both the incoming papers and also copies of most University of Michigan Business School papers. The number of papers from outside institutions varied each year, and papers appeared irregularly. No attempt was made to record and monitor them or to provide access to them. Michigan Business School papers, however, were fully cataloged with complete subject treatment, including subject headings and *Library of Congress Classification* (*LCC*). Other papers were shelved by institution in an internal workroom while librarians considered how to handle them.

In early 1975, the library queried fourteen peer business school libraries about retention period, bibliographic control practices, and how they provided holdings

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information to clients. The following decisions resulted:

1. to collect working papers in the English language only,
2. to organize working papers by issuing institution, control them through holdings cards, and arrange them together on the shelves,
3. to keep University of Michigan papers permanently and others for three years,
4. to provide access by author, title, institution, and preferably keyword,
5. to list new papers in the monthly "recent acquisitions" list mailed to business faculty and Ph.D. students, and
6. to cull from each year's discards individual papers considered important enough to catalog into the main collection as standard monographs.

All but two of these decisions (3 and 6) remain the guiding principles behind the treatment of the collection. In 1987 it was decided to extend the retention period to five years to accommodate client requests for papers cited in bibliographies older than the three-year limit. In conjunction with this decision, it was agreed that papers would be discarded after five years and not reviewed further by selectors.

Based on the expressed needs of faculty and Ph.D. students in 1983, the library increased the number of institutions solicited for papers and changed some of the institutions solicited. Initially, a letter was directed to each institution's library requesting an exchange of working papers. The next strategy was to contact librarians known through networks or other professional involvement, resulting in a few personal exchanges. Letters were then addressed to the directors of various research units, requesting information about availability of working papers through exchange or subscription. A few institutions agreed to send lists of available papers from which titles could be selected and ordered. A few more creative approaches included asking faculty to contact other institutions for access to mailing lists, contacting former Ph.D. students now at other schools, and monitoring published lists of working papers received by other institutions through their acquisitions lists. Today, almost eighty institutions are represented in the library's collection.

BIBLIOGRAPHIC CONTROL AND ACCESS

PHASE 1

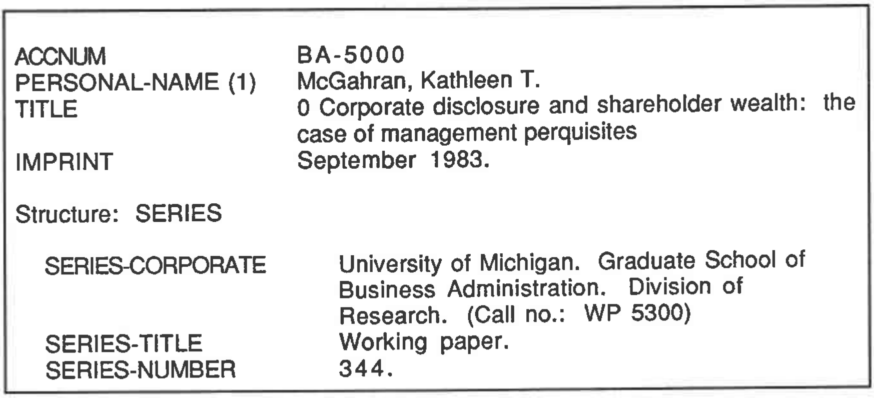
An effective definition of working papers was provided by Jean E. Koch and Judith M. Pask: "They are an informal, current means of circulating research results variously referred to as discussion papers, research papers, and seminar papers."[1] They also appear under such terms as working papers, occasional papers, technical papers and conference reports and are issued by university departments, government departments, foundations, and research institutions. They describe work in progress and are usually published as simple copies with slightly heavier paper covers.

Usually, the various terms used to describe working papers are also used as the names or part of the names of the different series published by individual institutions or their research centers. Examples from the library's own collection, quoted from their traced series line, include:

Working paper (University of Michigan. School of Business Administration. Division of Research)
Technical working paper (Marketing Science Institute)
International finance discussion papers [issued by the Board of Governors of the Federal Reserve System]
Economic research reports (C. V. Starr Center for Applied Economics [New York University])
Working paper series in information management [issued by the University of Illinois at Chicago, Center for Research in Information Management]

These examples show how working papers form a genre of their own and how naturally they can be grouped by institution and by series.

The decisions of 1975 proved to be the library's first major brush with workload problems. There was insufficient staff to provide full Kardex control or cataloging and classification of these materials, and keyword search capability was unavailable



```
ACCNUM                 BA-5000
PERSONAL-NAME (1)      McGahran, Kathleen T.
TITLE                  0 Corporate disclosure and shareholder wealth: the
                       case of management perquisites
IMPRINT                September 1983.

Structure: SERIES

   SERIES-CORPORATE       University of Michigan. Graduate School of
                          Business Administration. Division of
                          Research. (Call no.: WP 5300)
   SERIES-TITLE           Working paper.
   SERIES-NUMBER          344.
```

Figure 1. Sample SPIRES Database Entry.

in the standard catalog. The requirement that all working papers be shelved together put additional constraints on classification. To rise to these challenges, the library chose to forego traditional handling and devise an in-house database on the Stanford Public Information Retrieval System (SPIRES). This approach enabled the library to provide the desired access and assign an in-house call number from the number automatically created by the database. (For a full discussion of the evolution of call numbers, see below.)

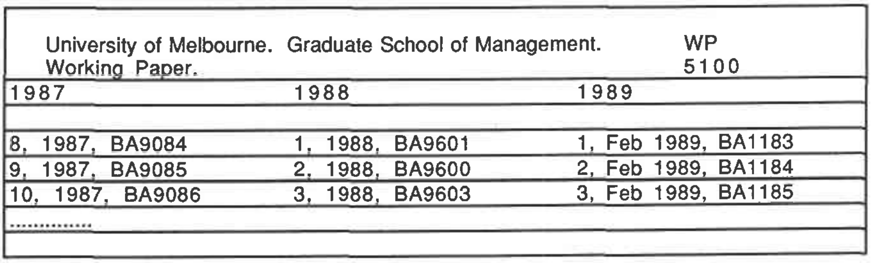
The SPIRES database was designed with a MARC-like structure, including some indicators, that provided access by personal or corporate name, title, series title, keyword in title, and accession number. A sample SPIRES entry is given in figure 1. Note the indicator at the beginning of the title line giving the number of nonfiling characters.

This new system was an improvement. Materials were available both on the shelves and through records. Records were online and could be searched by staff and clients. A list of new working papers was created each month and appended to the recent acquisitions list mailed to faculty and doctoral students. Student staff could enter the data with minimal supervision from permanent staff.

Records, however, were incomplete and not included in the catalog. Although working papers were shelved together, they were not distinguished by series within institutions, and there was no guarantee that issues fell in their proper sequence. Perhaps most significant, the system represented a downgrading in the treatment of Michigan Business School papers, especially in the movement away from full cataloging and subject headings to a brief record. Another weakness was in form of entry. Although series were created according to authorized forms, entry of individual authors was strictly from the title page without reference to any authority file. Finally, there was no formal check-in system, and the public tended to be unaware or to forget the existence of the online database.

To alleviate some of these problems, the library established a check-in system similar to that for other monographic series and serials. Itemized manual records had been kept in the shelflist on holdings cards, but each represented an institution not a series. This system was unsatisfactory; institutions began to issue multiple series. In 1989, a project was undertaken to establish one Kardex record for each series. Upkeep and check-in was then established as part of the routine of a full-time clerk. A sample Kardex card appears in figure 2.

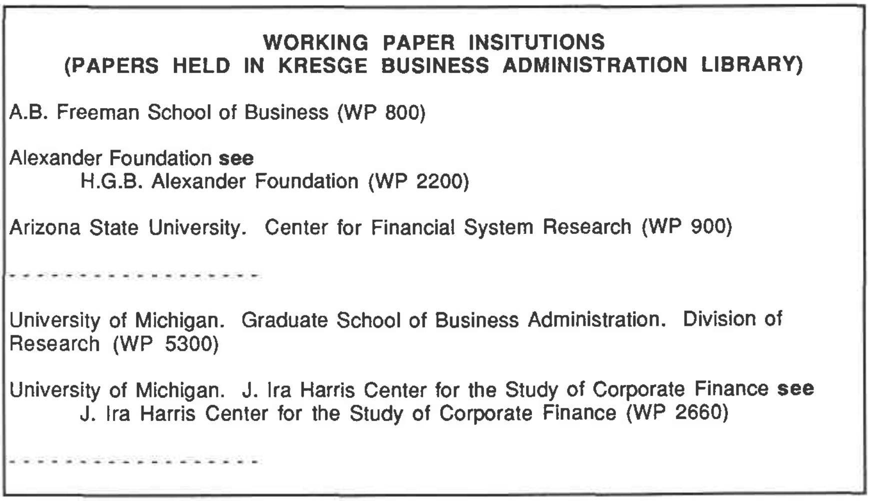
For extra control and another point of access, a list of all institutions was created, along with cross references. This list acts as an authority for the collection for technical services, but is also reproduced in a



University of Melbourne. Graduate School of Management. WP
Working Paper. 5100

1987	1988	1989
8, 1987, BA9084	1, 1988, BA9601	1, Feb 1989, BA1183
9, 1987, BA9085	2, 1988, BA9600	2, Feb 1989, BA1184
10, 1987, BA9086	3, 1988, BA9603	3, Feb 1989, BA1185
....		

Figure 2. Sample Kardex Card (First Version).



WORKING PAPER INSITUTIONS
(PAPERS HELD IN KRESGE BUSINESS ADMINISTRATION LIBRARY)

A.B. Freeman School of Business (WP 800)

Alexander Foundation **see**
H.G.B. Alexander Foundation (WP 2200)

Arizona State University. Center for Financial System Research (WP 900)

- - - - - - - - - - - - - - - - - -

University of Michigan. Graduate School of Business Administration. Division of Research (WP 5300)

University of Michigan. J. Ira Harris Center for the Study of Corporate Finance **see**
J. Ira Harris Center for the Study of Corporate Finance (WP 2660)

- - - - - - - - - - - - - - - - - -

Figure 3. Excerpt from Public Version of "Working Paper Institutions" List.

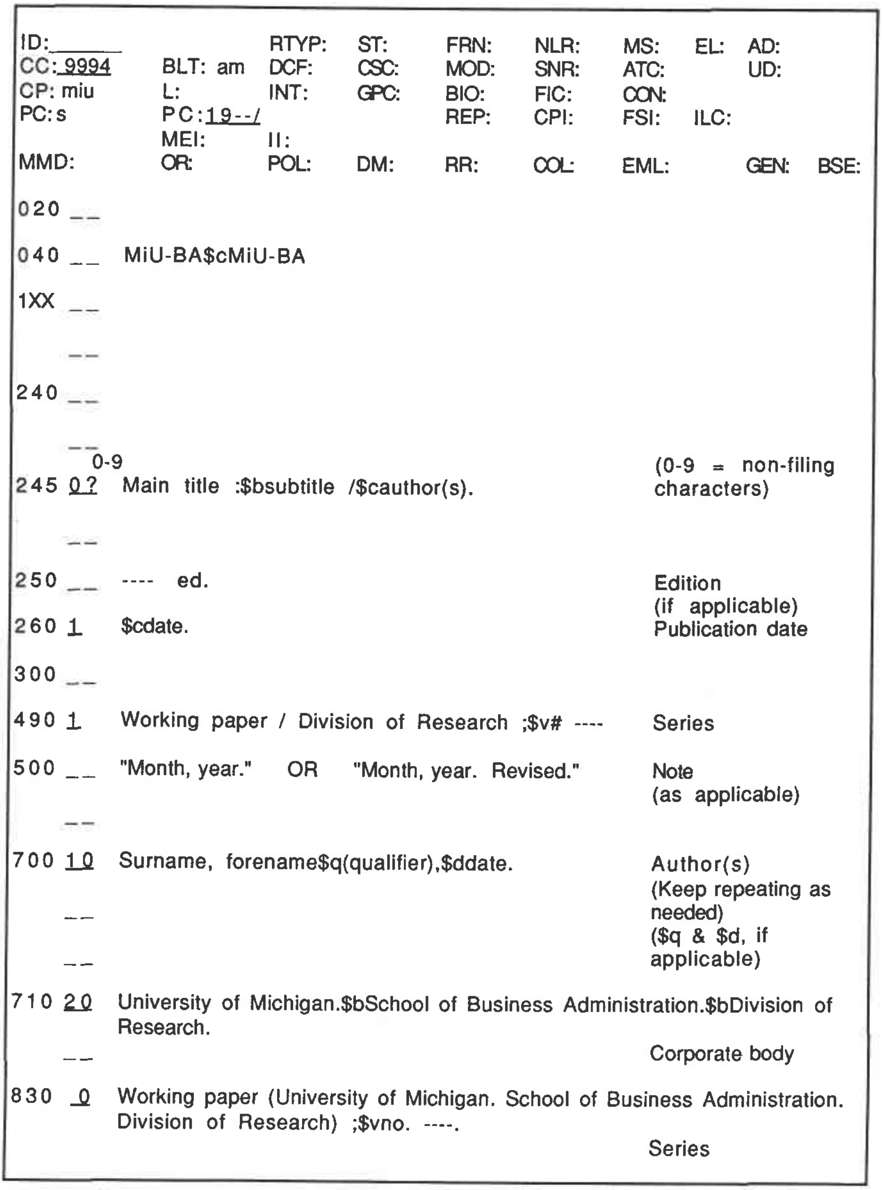
public form for distribution to clients. A sample from the public list is shown in figure 3.

These steps improved control and offered users another form of access, but working papers were still not reflected in the catalog.

PHASE 2

In 1989 several factors forced the library to review its handling of working papers. Access to the SPIRES database had been plagued by continual technical problems, and the capacity of the database was reaching its limit. Various records needed consolidation to create a single catalog and to prepare for a future online catalog. Discussions also took place at the Business Library Directors' meeting of May 1989 on the lack of national access to working papers and the possibility of entering records for these materials into national databases.[2]

The library decided to enter records for working papers into the Research Libraries Information Network (RLIN). All planning for this move was based on the principle that the library would offer no less access than had been offered through the SPIRES database, and it was hoped that the new plan would provide additional access for local and remote clients. The availability of title word and title phrase searching in RLIN made keyword searching possible, an important factor in the decision. On the other hand, the same resource limitations still existed, and student staff would be the main source of labor.



```
ID:______                 RTYP:   ST:    FRN:   NLR:   MS:    EL:   AD:
CC:9994     BLT: am       DCF:    CSC:   MOD:   SNR:   ATC:         UD:
CP: miu     L:            INT:    GPC:   BIO:   FIC:   CON:
PC: s       PC:19--/                     REP:   CPI:   FSI:   ILC:
            MEI:          II:
MMD:        OR:           POL:    DM:    RR:    COL:   EML:         GEN:   BSE:

020 __

040 __   MiU-BA$cMiU-BA

1XX __

    __

240 __

    __
     0-9
245 0?   Main title :$bsubtitle /$cauthor(s).             (0-9 = non-filing
                                                           characters)

    __

250 __   ---- ed.                                          Edition
                                                           (if applicable)
260 1    $cdate.                                           Publication date

300 __

490 1    Working paper / Division of Research ;$v# ----    Series

500 __   "Month, year."   OR   "Month, year. Revised."     Note
                                                           (as applicable)
    __

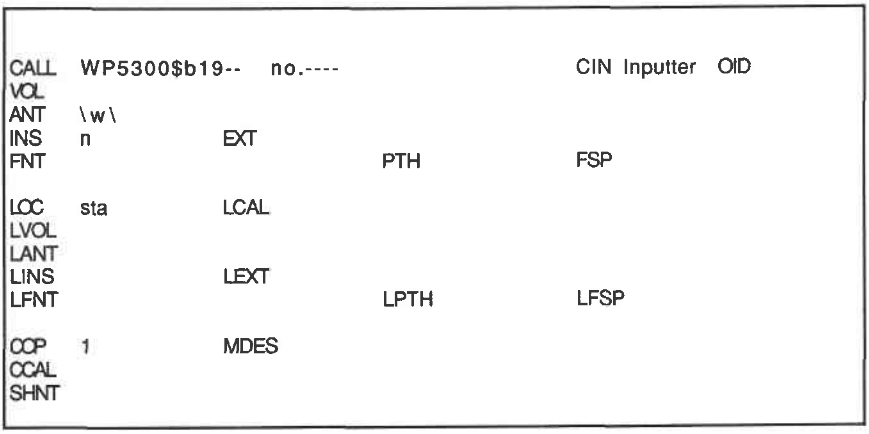
700 10   Surname, forename$q(qualifier),$ddate.            Author(s)
                                                           (Keep repeating as
    __                                                     needed)
                                                           ($q & $d, if
    __                                                     applicable)

710 20   University of Michigan.$bSchool of Business Administration.$bDivision of
         Research.
    __                                                     Corporate body

830  0   Working paper (University of Michigan. School of Business Administration.
         Division of Research) ;$vno. ----.
                                                           Series
```

Figure 4a. Sample Template (Page 1).

Duties were therefore carefully divided between a librarian and student staff. The librarian became responsible for preparing a full serial record for each series title, according to standard cataloging practices, creating a "template" for each series as a guide for students and assigning a new call number. A sample template is shown in figures 4a and 4b.[3] Figure 5 describes the brief record contents. The librarian also assumed responsibility for verifying all series and other authorities referred by stu-

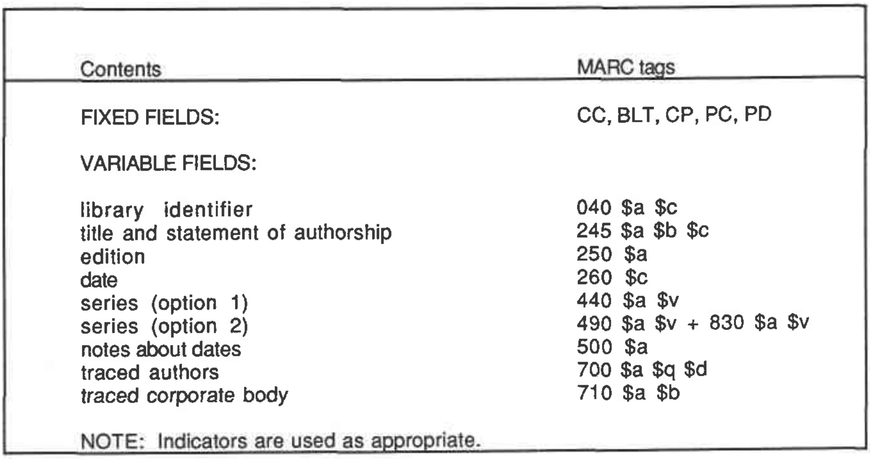


```
CALL  WP5300$b19--  no.----                        CIN Inputter  OID
VOL
ANT   \w\
INS   n             EXT
FNT                               PTH              FSP

LOC   sta           LCAL
LVOL
LANT
LINS                LEXT
LFNT                              LPTH             LFSP

COP   1             MDES
CCAL
SHNT
```

Figure 4b. Sample Template (Page 2).



Contents	MARC tags
FIXED FIELDS:	CC, BLT, CP, PC, PD
VARIABLE FIELDS:	
library identifier	040 $a $c
title and statement of authorship	245 $a $b $c
edition	250 $a
date	260 $c
series (option 1)	440 $a $v
series (option 2)	490 $a $v + 830 $a $v
notes about dates	500 $a
traced authors	700 $a $q $d
traced corporate body	710 $a $b

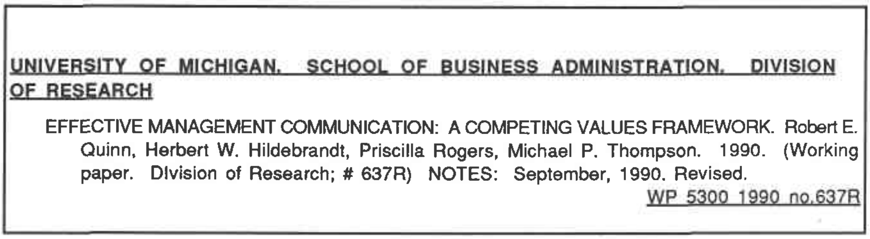
NOTE: Indicators are used as appropriate.

Figure 5. Table of Brief Record Contents (Based on RLIN Record and Its Requirements).

dents and handling any other problems. Student staff responsibilities included entering a brief monographic record into RLIN for each title in a series, using the templates as guides and checking the authority file on RLIN, and completing the physical processing. Check-in and Kardex control were left with the permanent library clerk.

Although the record is brief, it conforms to the *Anglo-American Cataloguing Rules*, second edition (*AACR2*) with two exceptions. First, all entries are treated as title main entries to eliminate the need for students to choose main entry. This decision was not viewed as a major problem because automation is imminent, and an online catalog reduces the critical nature of main entry choice. All authors are listed in the record, enabling the vendor who creates the library's monthly recent acquisitions list to print the authors' names as part of the entry.[4] A sample from this list is given in figure 6. This procedure, in turn, affected the Kardex card, which had previously included the accession number. The Kardex card was modified to appear as shown in figure 7.

To implement this system, records for all 1990 papers were entered into RLIN by student staff, using the templates. The SPIRES database was frozen except to

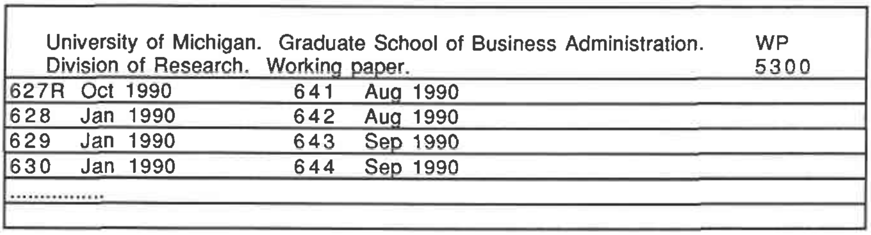


UNIVERSITY OF MICHIGAN. SCHOOL OF BUSINESS ADMINISTRATION. DIVISION OF RESEARCH

EFFECTIVE MANAGEMENT COMMUNICATION: A COMPETING VALUES FRAMEWORK. Robert E. Quinn, Herbert W. Hildebrandt, Priscilla Rogers, Michael P. Thompson. 1990. (Working paper. Division of Research; # 637R) NOTES: September, 1990. Revised.

WP 5300 1990 no.637R

Figure 6. Sample Entry from "Recent Acquisitions" List.



University of Michigan. Graduate School of Business Administration. Division of Research. Working paper. WP 5300

627R	Oct 1990	641	Aug 1990
628	Jan 1990	642	Aug 1990
629	Jan 1990	643	Sep 1990
630	Jan 1990	644	Sep 1990
....			

Figure 7. Sample Kardex Card (Second Version).

delete records for papers discarded in the annual weeding process.

THE EVOLUTION OF CALL NUMBERS

Originally, Michigan Business School papers were assigned the call number HF 5001 .M62. When the SPIRES database was created, the database automatically assigned an accession number to each paper and that number was used as the call number, for example, BA9262, where *BA* stands for Business Administration. This number was also assigned to the newly received Michigan Business School papers. In 1987, due to the growing number of institutions held (nearly eighty) and the increase in the number of papers held from each institution, that scheme became inadequate. A new series of numbers was devised, based on an alphanumeric system in which the first line contained the letters *WP* for working paper, the second line was a cataloger-assigned number that alphabetized the institutions, and the third line incorporated the assigned accession number from the SPIRES database; for example:

WP
5300
BA5000

Once again, the accession number shelved the papers in order of receipt which normally, but not necessarily, coincided with the order of publication. In addition, the second line alphabetized institutions but did not separate series within them, a move that was not seen as necessary at the time because the library collected very few multiple series from a single institution.

In 1989, in conjunction with the move to catalog working papers into RLIN, the WP number was modified again. The accession number created by the SPIRES system was no longer available, and it was decided to ensure the proper sequence of the papers on the shelf. The first two lines of the number were retained and expanded so that each number was unique to a series rather than its parent institution, and the date and series number were added on the following two lines. This ensured that the papers now fell within their own separate series, by year within that, and by series number within that; for example:

WP
5300
1991
no. 672

Michigan Business School papers were now in a particularly unsatisfactory condition. The library still had the original group cataloged and classified in HF 5001 .M62. In addition, there was the more recent group shelved under the old WP number. Now, there was a third set under the new WP number. A two-part project was undertaken. In the summer of 1990, the library hired a library science student to convert the classified papers to the new WP classification and enter them into RLIN. In the summer of 1991, a second student converted the 447 working papers under the old WP numbers to the new WP classification and entered them into RLIN. All Michigan Business School papers are now classified and shelved together under the new scheme and reside in the RLIN database.

MANAGEMENT IMPLICATIONS

A notable part of the working papers process is its evolutionary nature. Each stage of the process has been driven by the following factors:

- Policy was set early enough to move in the right direction.
- Growing volume, at various points, forced change.
- Staff resources were always finite.
- Users were queried periodically about their needs.
- At various points in the process certain technologies were available, while others were not.
- The library did not close the door on future options, although this was sometimes fortuitous rather than planned!
- The limited retention period made change more feasible.
- The techniques learned with working papers can be transferred to other projects.

Perhaps the most important lesson is that a less-than-ideal solution can be implemented as long as it moves in the right direction and does not cut off paths to the future. While it can be frustrating to handle materials more than once, it may be a myth that the best plan is to handle something only once. Conditions change, offering different opportunities. Needs change, requiring different solutions. Staff change, bringing new ideas. At the beginning of the process, the current stage could not have been envisioned.

In retrospect, the most critical element is the classification number. Classification numbers root materials in place, and a change to a numbering scheme forces retrospective change if all materials are to sit together on the shelf. It is the most disturbing element in the jigsaw puzzle combination of collection and records. The change from the accession number system to the first WP system forced the first retrospective conversion. The change from the first WP system to the second forced the next retrospective conversion, and in both cases the saving grace clearly lay in the library's limited retention period for all but Michigan Business School papers. This leads to two conclusions: first, if at all possible, try to ensure the correct decision making about classification early in the planning process, and second, treat the call number as the Achilles' heel when it comes to making change.

CONCLUSIONS

The primary benefit of the new arrangement is that materials are in both the library's catalog and RLIN. Second, when conversion to an automated system is undertaken, the working papers, as part of the RLIN database, should present no unique conversion problems. Third, the library has continued to limit the bulk of the labor to student help.

The problem is that the new system takes more time of permanent staff than was originally anticipated. The full impact of this will depend on the number of changes to the institutions and series held by the library. The current selection plan is to keep the number of institutions at about eighty, which will help. In addition, student training is more critical than was the case with the SPIRES database. There is more at stake when materials are part of the catalog and entered into a national database.

The library's current practices for handling working papers are still not ideal, but they provide much needed access to this important collection. Within the management constraints of time, staff level, and monetary resources, creative solutions have been found. The greatest flaw at this time is the library's inability to provide full access, including subject headings, to the Michigan Business School papers, but the availability of title word and title phrase searching in RLIN alleviates that to some extent and resources will not permit such extensive subject work. The future online catalog will enhance the keyword option through the addition of Boolean searching.

The Kresge Business Administration Library is proud of its working paper collection and pleased that it can provide access to this important collection within the limits of its resources.

References

1. Jean E. Koch and Judith M. Pask, "Working Papers in Academic Business Libraries," *College & Research Libraries* 41:517 (1980).
2. The annual meeting of the Business Library Directors was held on May 3, 1989 in the School of Business Administration at the University of Michigan, Ann Arbor, MI 48109-1234.
3. The template is based on the RLIN template provided in Research Libraries Group, *Cataloging in RLIN II: User's Manual* (Stanford, Calif.: Research Libraries Group, 1987).
4. The "Recent Acquisitions" list is produced from the library's monthly RLIN tape by Ward and Associates, Inc., 317 Division, Suite 66, Ann Arbor, MI 48104.

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Notes on Research

ARIS Music Thesaurus: Another View of *LCSH*

Harriette Hemmasi

In an attempt to improve access to music materials, a project to create a preliminary music thesaurus—a tool by which terms and their relationships can be displayed, analyzed, and evaluated—was initiated. Music headings from Library of Congress Subject Headings (LCSH) *were converted to the data format for Anderson Rowley Information Systems (ARIS) thesaurus construction software. Thesaurus display options are described. ARIS provides significant enhancements for searching terms, tracking relationships among headings, and gaining an overview of music vocabulary in* LCSH.

Improving Access to Music," the 1989 report of the Music Library Association Music Thesaurus Project Working Group, cites basic weaknesses in both the terminology and structure of the *Library of Congress Subject Headings* (*LCSH*) for music and calls for "a controlled vocabulary that is more logically structured and more easily manipulated."[1] In retrospect, the accumulation of LC headings was begun in 1898, and Roget had developed his thesaurus only fifty years earlier. At that time there was no conception of a hierarchically structured thesaurus of indexing terms. Since their inception, LC headings have been created and are maintained to reflect the Library of Congress' collections. Because of its ad hoc mode of compilation, consistency in *LCSH*'s formal and conceptual structure is, at best, incidental. By definition, *LCSH* is a list of subject terms, rather than a thesaurus. Its goal is to record specific terminology and to control its usage. In so doing, it limits the vocabulary and the access to that vocabulary.

Recognizing these deficiences, in 1981 Cochrane encouraged the development of subject-specific vocabularies to act as a supplement to *LCSH*.[2] Noteworthy accomplishments within the last ten years are: *Art & Architecture Thesaurus* (*AAT*); *Genre Terms: A Thesaurus for Use in Rare Book and Special Collections Cataloging; Form Terms for Archival and Manuscripts Control; Descriptive Terms for Graphic Materials; Moving Image Materials; Printing and Publishing Evidence; Binding Terms*; and *Provenance Evidence*.[3]

Challenged by these demands and, in particular, the example set by *AAT*, a proposal to create a music thesaurus was submitted to the Council on Library Resources and was subsequently funded as a cooperative research grant in July 1991. The goal of the project is to create a preliminary music thesaurus—a tool by which terms and their relationships can be dis-

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played, analyzed, and evaluated. Music terms from *LCSH* and the *Dewey Decimal Classification*, 780 schedule (20th edition), the representative standard vocabulary used by the majority of music information resources, were chosen to act as the initial base of the thesaurus. Data from these two publications have now been transferred to Anderson Rowley Information Systems (ARIS), a thesaurus construction software program developed by James D. Anderson and Frederick A. Rowley.[4] The music thesaurus follows the latest National Information Standards Organization standards and every effort is made to ensure that compatability with thesauri-specific USMARC fields (654, 655, 755) and the USMARC authorities format is maintained. This research note contains information about the conversion process applied to LC music headings, the display options for those headings available through ARIS, and analysis of the results of increased access to *LCSH*.

CONVERSION

LC music headings were gathered from two sources. The largest number of headings, about 90 percent of the total music headings used, is from the 1988 Soldier Creek Press publication, *Music Subject Headings*, which includes LC headings available through December 1987.[5] These headings were provided by Soldier Creek Press in IBM PC-compatible ASCII files converted from their book manuscript, which was originally prepared in Pagemaker for the Macintosh. Because the manuscript was equivalent to nearly 300 pages in length, manual manipulation of the data was cumbersome and too time-consuming a process. Therefore, a series of short programs was written in Turbo Pascal to automatically convert the data to a formatted ARIS database file. Using indentation and existing tags (UF, SA, RT, NT, BT) as clues to field identity, the first program identified, marked, and separated textual passages in the manuscript according to their field membership. Another program removed page column word-wrap from the passages. Still another handled diacritical marks that were represented in the full-text by characters used for the Macintosh. These were incompatible with the screen display found on U.S. IBM-compatible PCs. Where possible, characters containing diacritical marks were converted to their IBM counterparts. Inconvertible ones were translated to the closest possible plain English letters.

One problem was encountered in automating identification of LC Classification (LCC) numbers, which in the Soldier Creek Press layout were contained in parentheses following appropriate subject headings. In the printed edition, headings clearly appear in boldface type, whereas call numbers appear in normal type. However, because typesetting information had been removed, there was no way to distinguish positively every call number from subject headings that contained parentheses. This resulted in later having to correct some records by hand.

Another situation encountered with the full text was that some descriptions for headings contained nested subdivisions. For example, listed under the heading **Music** are the subdivisions **History and criticism** and **Methods**. A procedure was written that essentially un-nested these subdivisions, correlated them with the lead term (in this case, **Music—History and criticism** and **Music—History and criticism—Methods**), and created separate records for headings that contain subdivisions.

New or changed headings, which were added to *LCSH* after the Soldier Creek Press publication, were identified through the January 1988–September 1991 issues of *Music Cataloging Bulletin*.[6] These headings were then searched in the subject authority file (SAF) in the Research Libraries Information Network (RLIN) and downloaded to disk in MARC communication format. An additional Pascal program was written that translated the SAF records into the ARIS database format. Central to converting both the Soldier Creek Press and SAF data was understanding the tag and field relationships between the print and online versions of *LCSH* and then directing that information into the appropriate ARIS fields (see figures 1a and 1b).

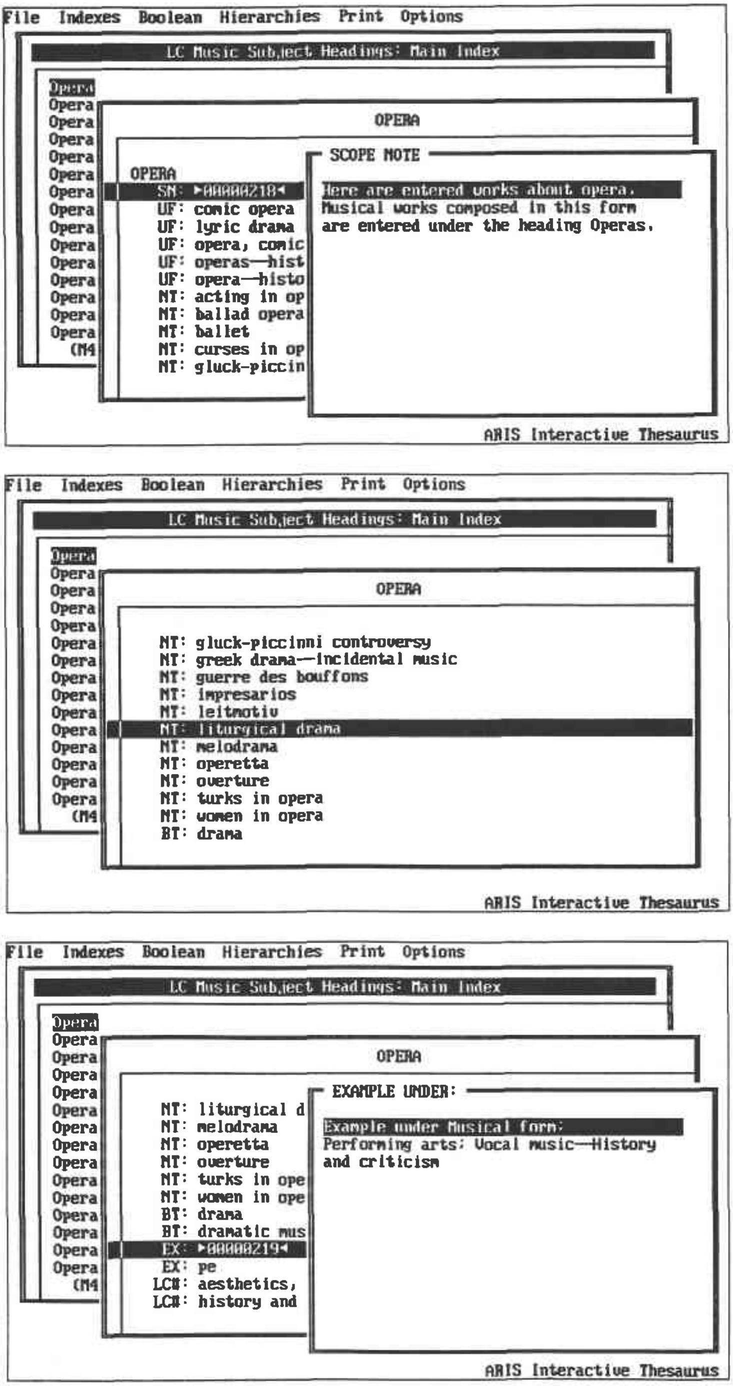
Equivalency among the data elements

Opera [May Subd Geog] *(Aesthetics, ML3858;*
History and criticism, ML1700-ML2110)
Here are entered works about opera.
Musical works composed in this form
are entered under the heading Operas.
UF Comic opera
Lyric drama
Opera—History and criticism
Opera, Comic
Operas—History and criticism
BT Drama
Dramatic music
NT Acting in opera
Ballad opera
Ballet

NT Curses in opera
Gluck-Piccinni controversy
Greek drama—Incidental music
Guerre des Bouffons
Impresarios
Leitmotiv
Liturgical drama
Melodrama
Operetta
Overture
Turks in opera
Women in opera
Example under Musical form; Performing arts;
Vocal music—History and criticism
Note under Operas

```
ID:SAFL8594900     ST:p    EL:n    STH:a    MS:c    UIP:a    TD:19890502115559
KRC:a    NMU:b    CRC:n    UPN:n    SBU:a    SBC:a    DID:i    DF:02-11-86
RFE:b    CSC:     SRU:b    SRT:n    SRN:n    TSS:?    TGA:?    ROM:?   MOD:
VST:d 05-22-89                         Other Versions: earlier
040      DLC$cDLC$dDLC
053      ML1700$bML2110$cHistory and criticism
053      ML3858$cAesthetics
150    0 Opera
450    0 Comic opera
450    0 Lyric drama
450    0 $wnne$aOpera$xHistory and criticism
450    0 Opera, Comic
450    0 Operas$xHistory and criticism
550    0 $wg$aDrama
550    0 $wg$aDramatic music
680      $iHere are entered works about opera. Musical works composed in this
    form are entered under the heading$aOperas.
681      $iExample under$aMusical form; Performing arts; Vocal music--History
    and criticism
```

Figure 1a. *LCSH* Print Version; Subject Authority File (SAF), RLIN.



File Indexes Boolean Hierarchies Print Options
LC Music Subject Headings: Main Index
ARIS Interactive Thesaurus

```
Opera
Opera      OPERA
Opera
Opera                                 SCOPE NOTE
Opera     OPERA
Opera        SN: ▸00000218◂           Here are entered works about opera.
Opera        UF: comic opera          Musical works composed in this form
Opera        UF: lyric drama          are entered under the heading Operas.
Opera        UF: opera, comic
Opera        UF: operas—hist
Opera        UF: opera—histo
Opera        NT: acting in op
Opera        NT: ballad opera
Opera        NT: ballet
Opera        NT: curses in op
 (M4         NT: gluck-piccin
```

```
Opera
Opera      OPERA
Opera
Opera
Opera
Opera        NT: gluck-piccinni controversy
Opera        NT: greek drama—incidental music
Opera        NT: guerre des bouffons
Opera        NT: impresarios
Opera        NT: leitmotiv
Opera        NT: liturgical drama
Opera        NT: melodrama
Opera        NT: operetta
Opera        NT: overture
Opera        NT: turks in opera
 (M4         NT: women in opera
             BT: drama
```

```
Opera
Opera      OPERA
Opera
Opera                                 EXAMPLE UNDER:
Opera
Opera        NT: liturgical d         Example under Musical form;
Opera        NT: melodrama            Performing arts; Vocal music—History
Opera        NT: operetta             and criticism
Opera        NT: overture
Opera        NT: turks in ope
Opera        NT: women in ope
Opera        BT: drama
Opera        BT: dramatic mus
Opera        EX: ▸00000219◂
Opera        EX: pe
 (M4        LC#: aesthetics,
            LC#: history and
```

Figure 1b. ARIS Thesaurus Display.

TABLE 1

TABLE OF TAG AND FIELD EQUIVALENCIES

Description	Print	SAF	**ARIS** Conversion
CALL NUMBER	in ( ) after main heading	053	LC#
HEADING	**BOLD** typeface	150	
COMPLEX SEE REF.	USE	260 (*index display: x c*)	UF
COMPLEX SEE ALSO REF.	SA	360	SA
SEE REF.	USE	450 (index display: x)	UF
USE FOR	UF	450	UF
EARLIER FORM OF HEADING	UF	450 $wnne	UF
RELATED TERM	RT	550	RT
BROADER TERM	BT	550 $wg	BT
NARROWER TERM	NT	— (index display: xx)*	NT
SOURCE OF DATA	—	670	†
SCOPE NOTE	indented, full text	680	SN
EXAMPLE TRACING	*Example under*	681	EX
NOTE	*Note under*	681	‡

[*] 550 $wh is a specified MARC authority field for narrower terms, but is not used.

[†] LC Source data were omitted from the **ARIS** database except to indicate whether a term was acquired *from Soldier Creek, the authority file, or both.*

[‡] Omitted in current version.

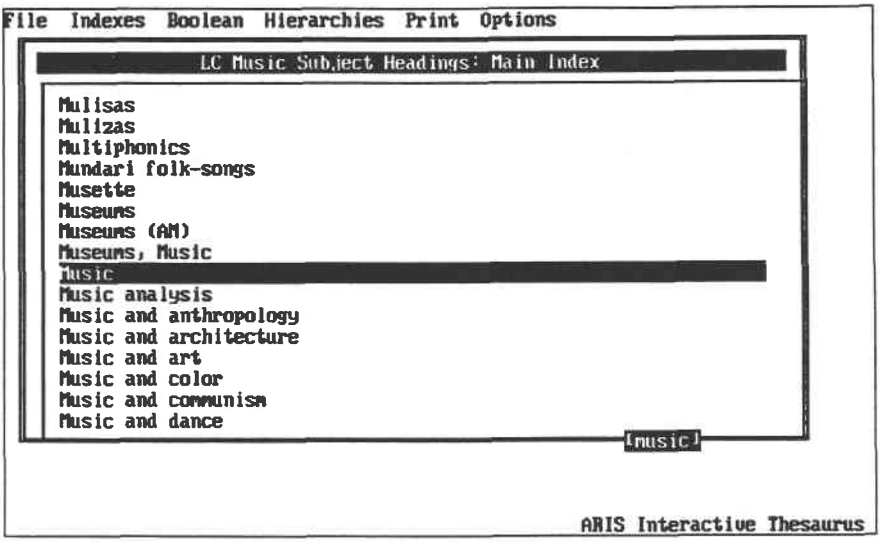
was established using a conversion table (see table 1). Once both sets of data had been converted to ARIS format, they could be seamlessly merged with each other into a single thesaurus file that consists of approximately 10,000 records.

GENERATING VARIOUS THESAURUS DISPLAYS

A thesaurus is a hierarchically structured database that can be displayed in a variety of useful ways. Its objective is to create displays that help the user get an overview of the subject matter and to navigate effectively from one conceptual area to another. Unlike their printed counterparts, onscreen thesaurus displays can be used for interactive exchange. ARIS software makes it possible to specify the fields that are to appear in the thesaurus displays, their order within an entry, whether they are to appear as separate headings, and whether their reciprocal forms are to appear also as display entries. The ability to produce reciprocal entries for all data enables ARIS to create onscreen displays where all elements are linked with all other elements over the entire system. In the ARIS software, displays are generated automatically after selecting an option from an onscreen menu. Two displays were generated using the LC music subject headings database: the thesaurus display and the hierarchical display.

THESAURUS DISPLAY

The thesaurus display is an alphabetical listing of all categories of terms—preferred, used for, narrower, broader, and related terms. Mirroring the *LCSH* print



File Indexes Boolean Hierarchies Print Options

LC Music Subject Headings: Main Index

Mulisas
Mulizas
Multiphonics
Mundari folk-songs
Musette
Museums
Museums (AM)
Museums, Music
Music
Music analysis
Music and anthropology
Music and architecture
Music and art
Music and color
Music and communism
Music and dance

[music]
ARIS Interactive Thesaurus

Figure 2. Initial String Search.

version, thesaurus records also contain LCC numbers, scope notes, and "Example under" or "Note under" displays (see figure 1). The entire list can be scrolled through. The same method of scrolling through the entire file is used to scroll through a single record. Both initial and internal keyword, or more precisely "string," searching are available. To perform an initial string search, the first letter of a string is typed, causing the cursor to move to the specified location in the alphabetical listing (see figure 2).

An internal string search is initiated by typing any string into a special window. All occurrences of that string are highlighted throughout the alphabetical listing and remain highlighted until either that string is deleted or another string is entered (see figure 3).

Each term in every record is linked to its own record over the entire thesaurus. After a term is chosen, the range and direction of movement to associated terms are limited only by the terms contained in the original and associated records. The overall effect is that of a giant hypertext (see figures 4a, 4b, and 4c).

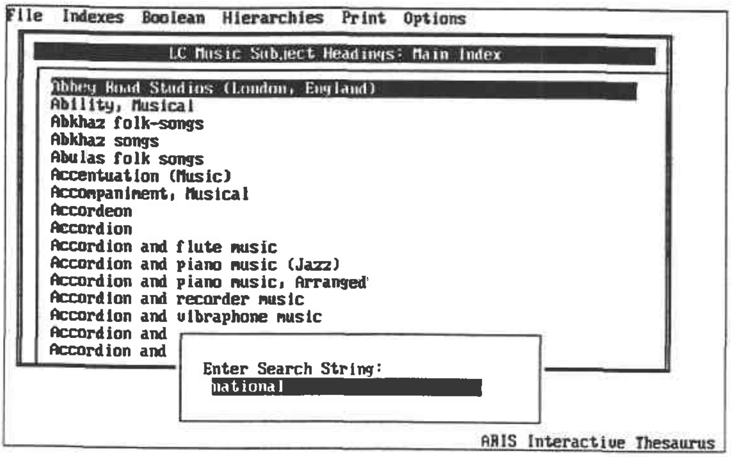
Not until a new search term is keyed is the link with the original search term broken. By having this link maintained, it is possible to retrace the path of a search. For example, after moving from the original search term, **Political ballads and songs**, to its narrower term, **Revolutionary ballads and songs**, the record of the broader term, **Political ballads and songs**, reappears. From that point, it is possible to move to another term contained in the record. There is no limit to either the number or the order of sequential searches.

The function of the thesaurus display is to allow:

- searching and viewing the record of any term in the thesaurus, whether that term is preferred, nonpreferred, broader, narrower, or related;
- tracing the path of selection and hierarchical connection among terms; and
- movement in any direction (i.e., from any term) within a record to any direction in a preceding or succeeding record, ad infinitum, without ever completely moving away from the original search term.

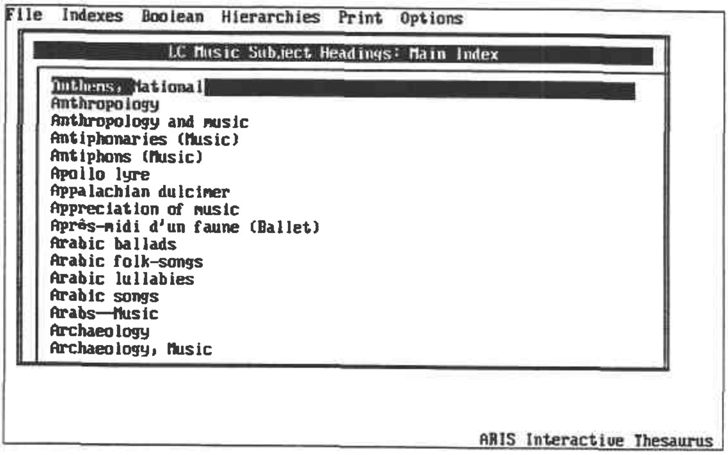
HIERARCHICAL DISPLAY

The hierarchical display is an alphabetical listing of terms that have associated narrower terms. Both initial and internal string searching function in the same manner as in

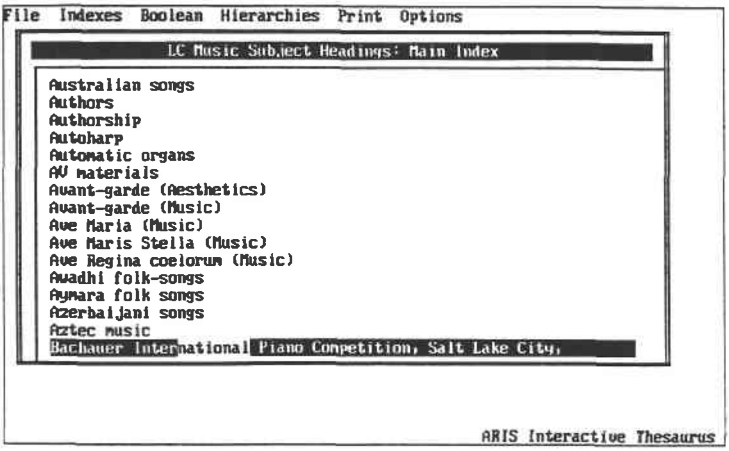

File Indexes Boolean Hierarchies Print Options
LC Music Subject Headings: Main Index
ARIS Interactive Thesaurus

```
Abbey Road Studios (London, England)
Ability, Musical
Abkhaz folk-songs
Abkhaz songs
Abulas folk songs
Accentuation (Music)
Accompaniment, Musical
Accordeon
Accordion
Accordion and flute music
Accordion and piano music (Jazz)
Accordion and piano music, Arranged
Accordion and recorder music
Accordion and vibraphone music
Accordion and
Accordion and

Enter Search String:
national
```

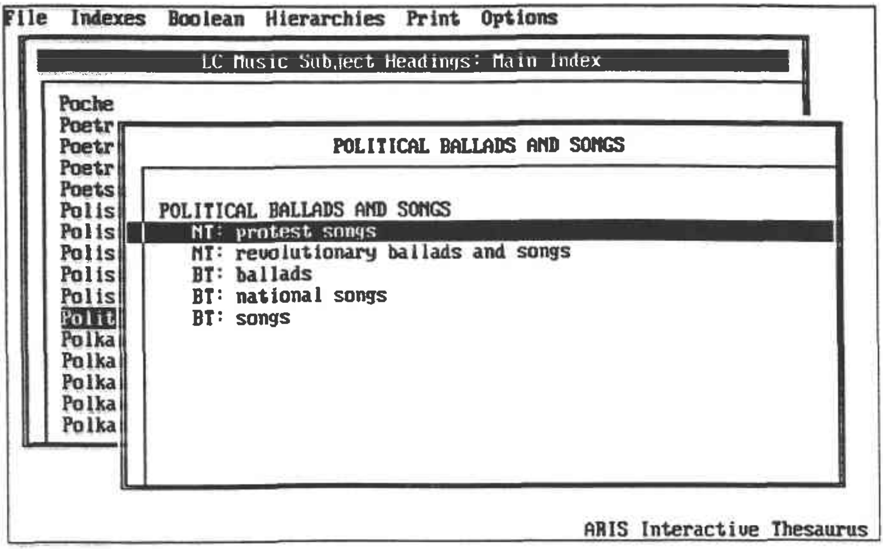

File Indexes Boolean Hierarchies Print Options
LC Music Subject Headings: Main Index
ARIS Interactive Thesaurus

```
Anthems, National
Anthropology
Anthropology and music
Antiphonaries (Music)
Antiphons (Music)
Apollo lyre
Appalachian dulcimer
Appreciation of music
Après-midi d'un faune (Ballet)
Arabic ballads
Arabic folk-songs
Arabic lullabies
Arabic songs
Arabs—Music
Archaeology
Archaeology, Music
```


File Indexes Boolean Hierarchies Print Options
LC Music Subject Headings: Main Index
ARIS Interactive Thesaurus

```
Australian songs
Authors
Authorship
Autoharp
Automatic organs
AV materials
Avant-garde (Aesthetics)
Avant-garde (Music)
Ave Maria (Music)
Ave Maris Stella (Music)
Ave Regina coelorum (Music)
Awadhi folk-songs
Aymara folk songs
Azerbaijani songs
Aztec music
Bachauer International Piano Competition, Salt Lake City,
```

Figure 3. Internal String Search.


File Indexes Boolean Hierarchies Print Options
LC Music Subject Headings: Main Index
ARIS Interactive Thesaurus

```
Poche
Poetr
Poetr
Poetr
Poets
Polis
Polis
Polis
Polis
Polis
Polit
Polka
Polka
Polka
Polka
Polka
```

```
POLITICAL BALLADS AND SONGS

POLITICAL BALLADS AND SONGS
    NT: protest songs
    NT: revolutionary ballads and songs
    BT: ballads
    BT: national songs
    BT: songs
```

Figure 4a. Thesaurus Display: Record Linkage (Original Search Term = First Generation).

the thesaurus display. Once a term is selected, it is highlighted in a numbered window in which the heading's narrower terms are also displayed. Fields that end with ► have narrower terms and can therefore be further searched (see figure 5). There is a maximum of twelve layers available onscreen, and up to fifty levels can be included in any single file.

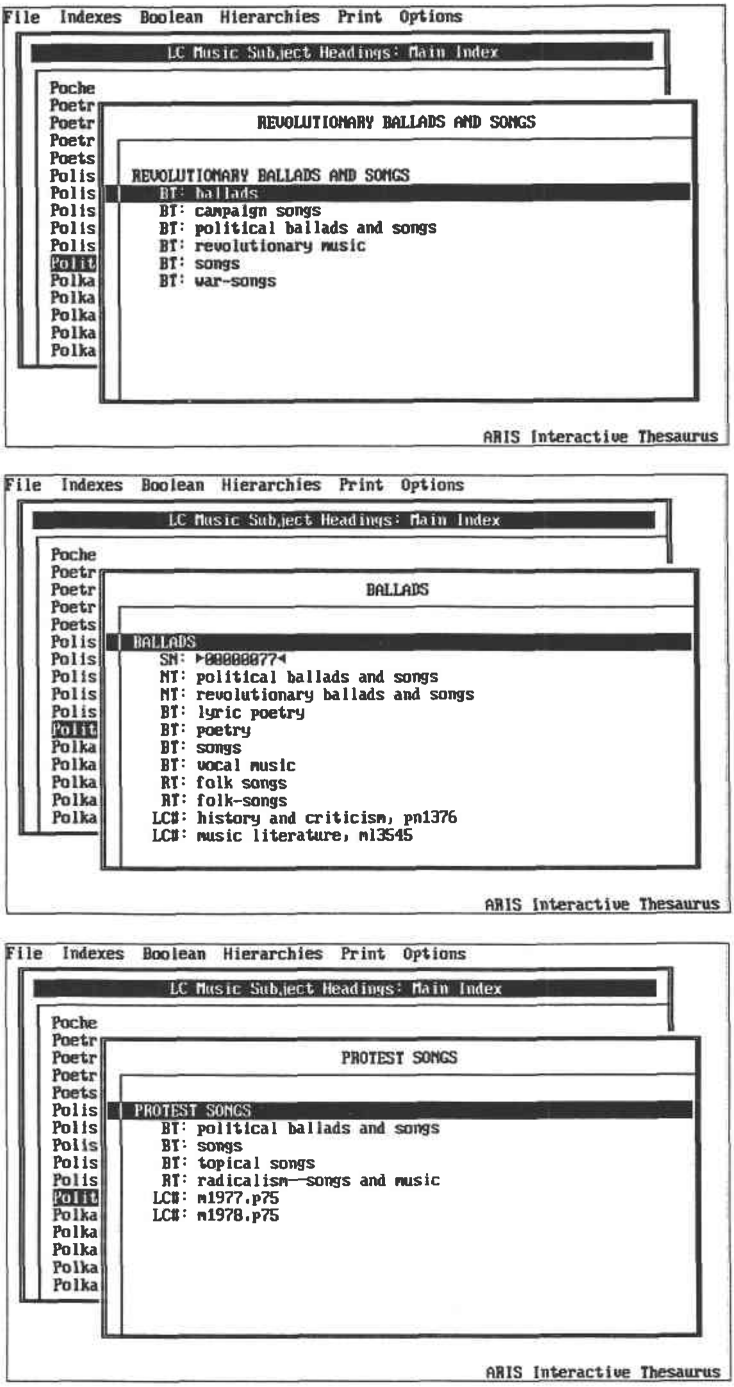
If midway in the regression a different, narrower term is chosen, the search path will be altered, but without ever moving from or losing the connection to the initial search term (see figure 6).

The function of the hierarchical display is also primarily threefold:

1. to search and display broad to narrow relationships;
2. to track sequential hierarchical levels of broad to narrow terms; and
3. to provide a means of moving among associated narrower terms without ever completely moving away from the original search term.

OTHER DISPLAYS

Files prepared by ARIS can be imported directly into popular word processors. Display files can also be used in desktop publishing programs. Users can search, manipulate, and collect data displayed onscreen. To demonstrate these capabilities, three print indexes were generated: Keyword in Context (KWIC), Keyword Out of Context (KWOC), and a list of the unique words (approximately 3,000) used in the music headings of *LCSH*. Each of these three displays provides yet another manner in which the LC music headings can be searched and viewed and from which associations might be drawn or better understood (see figures 7a and 7b). The value of these displays is not that they represent new ideas, but rather that they represent new approaches to accessing *LCSH*. It is hoped that such attempts will spawn other innovative and useful ideas.

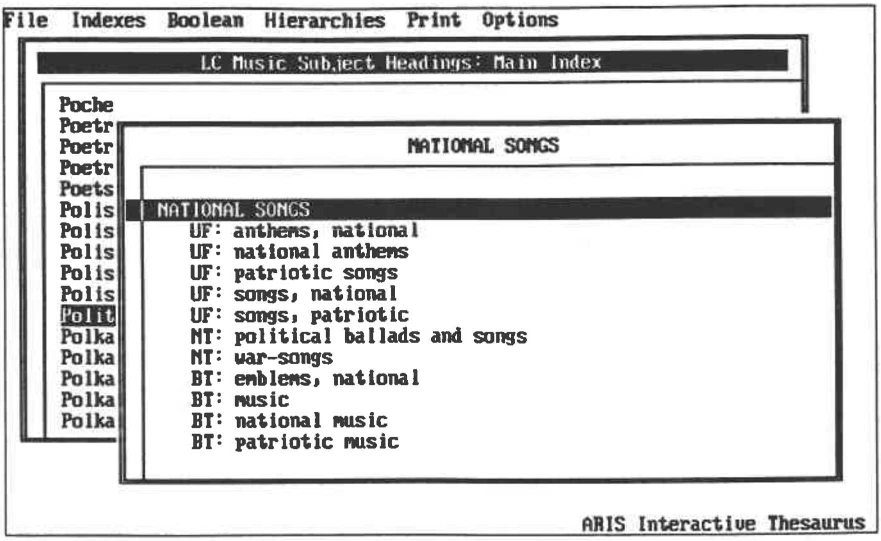

File Indexes Boolean Hierarchies Print Options
LC Music Subject Headings: Main Index
ARIS Interactive Thesaurus

```
Poche
Poetr    REVOLUTIONARY BALLADS AND SONGS
Poetr
Poetr
Poets    REVOLUTIONARY BALLADS AND SONGS
Polis       BT: ballads
Polis       BT: campaign songs
Polis       BT: political ballads and songs
Polis       BT: revolutionary music
Polis       BT: songs
Polit       BT: war-songs
Polka
Polka
Polka
Polka
Polka
```

```
Poche
Poetr    BALLADS
Poetr
Poetr
Poets    BALLADS
Polis       SN: ▸00000077◂
Polis       NT: political ballads and songs
Polis       NT: revolutionary ballads and songs
Polis       BT: lyric poetry
Polis       BT: poetry
Polit       BT: songs
Polka       BT: vocal music
Polka       RT: folk songs
Polka       RT: folk-songs
Polka      LC#: history and criticism, pn1376
Polka      LC#: music literature, ml3545
```

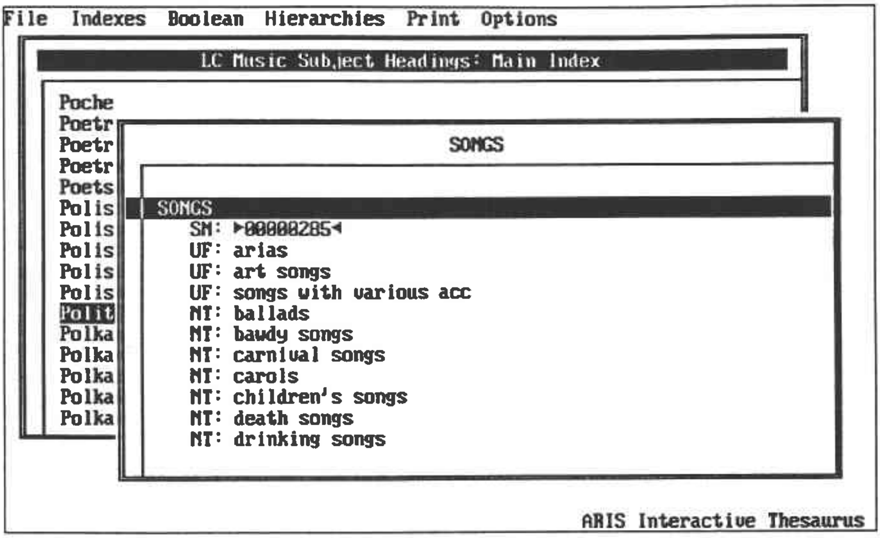
```
Poche
Poetr    PROTEST SONGS
Poetr
Poetr
Poets    PROTEST SONGS
Polis       BT: political ballads and songs
Polis       BT: songs
Polis       BT: topical songs
Polis       RT: radicalism—songs and music
Polit      LC#: m1977.p75
Polka      LC#: m1978.p75
Polka
Polka
Polka
Polka
```

Figure 4b. Thesaurus Display: Record Linkage (Second-Generation Terms).


File Indexes Boolean Hierarchies Print Options
LC Music Subject Headings: Main Index
Poche
Poetr
Poetr
Poetr
Poets
Polis
Polis
Polis
Polis
Polis
Polit
Polka
Polka
Polka
Polka
Polka
ARIS Interactive Thesaurus

```
NATIONAL SONGS

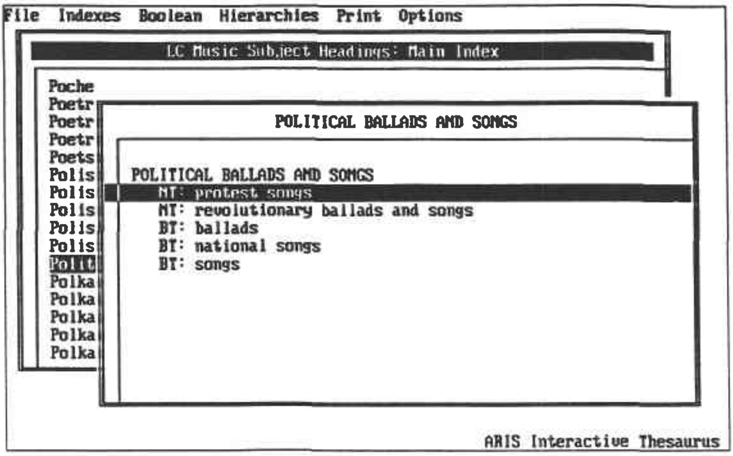
NATIONAL SONGS
     UF: anthems, national
     UF: national anthems
     UF: patriotic songs
     UF: songs, national
     UF: songs, patriotic
     NT: political ballads and songs
     NT: war-songs
     BT: emblems, national
     BT: music
     BT: national music
     BT: patriotic music
```


File Indexes Boolean Hierarchies Print Options
LC Music Subject Headings: Main Index
Poche
Poetr
Poetr
Poetr
Poets
Polis
Polis
Polis
Polis
Polis
Polit
Polka
Polka
Polka
Polka
Polka
ARIS Interactive Thesaurus

```
SONGS

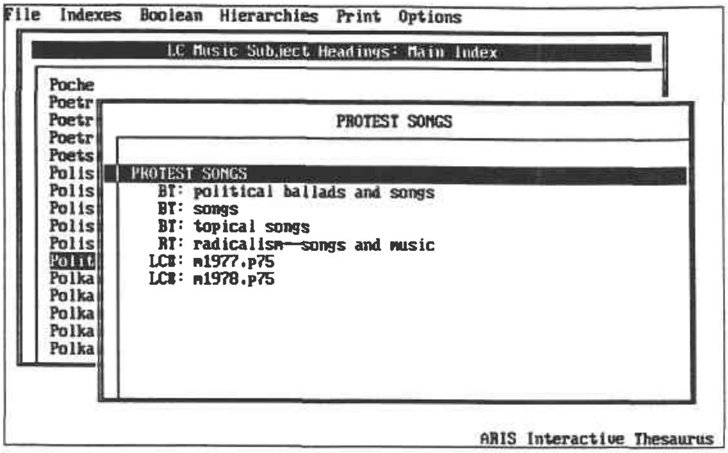
SONGS
     SN: ▸00000285◂
     UF: arias
     UF: art songs
     UF: songs with various acc
     NT: ballads
     NT: bawdy songs
     NT: carnival songs
     NT: carols
     NT: children's songs
     NT: death songs
     NT: drinking songs
```

Figure 4b continued.



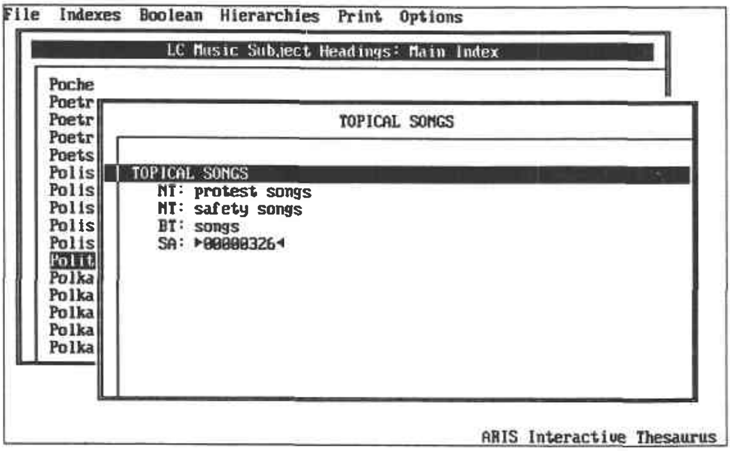
```
POLITICAL BALLADS AND SONGS

POLITICAL BALLADS AND SONGS
   NT: protest songs
   NT: revolutionary ballads and songs
   BT: ballads
   BT: national songs
   BT: songs
```



```
PROTEST SONGS

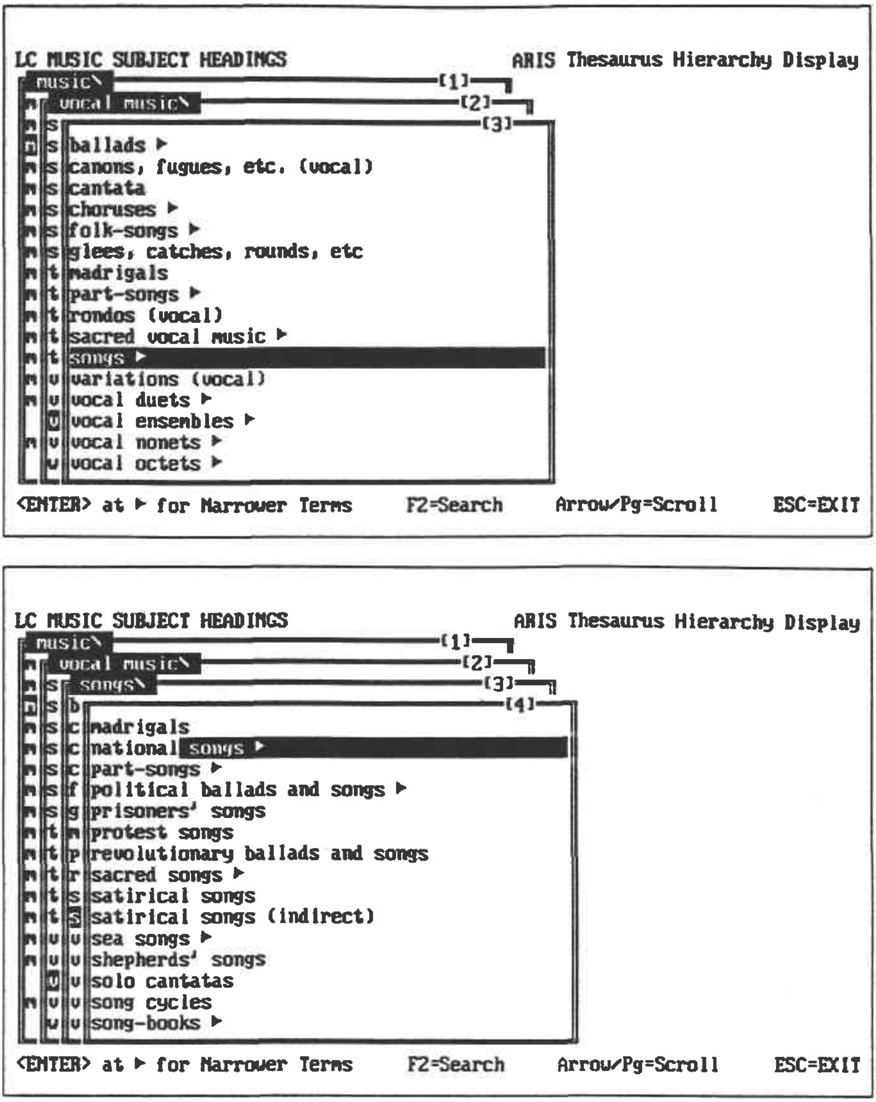
PROTEST SONGS
   BT: political ballads and songs
   BT: songs
   BT: topical songs
   RT: radicalism—songs and music
  LC#: m1977.p75
  LC#: m1978.p75
```



```
TOPICAL SONGS

TOPICAL SONGS
   NT: protest songs
   NT: safety songs
   BT: songs
   SA: ►00000326◄
```

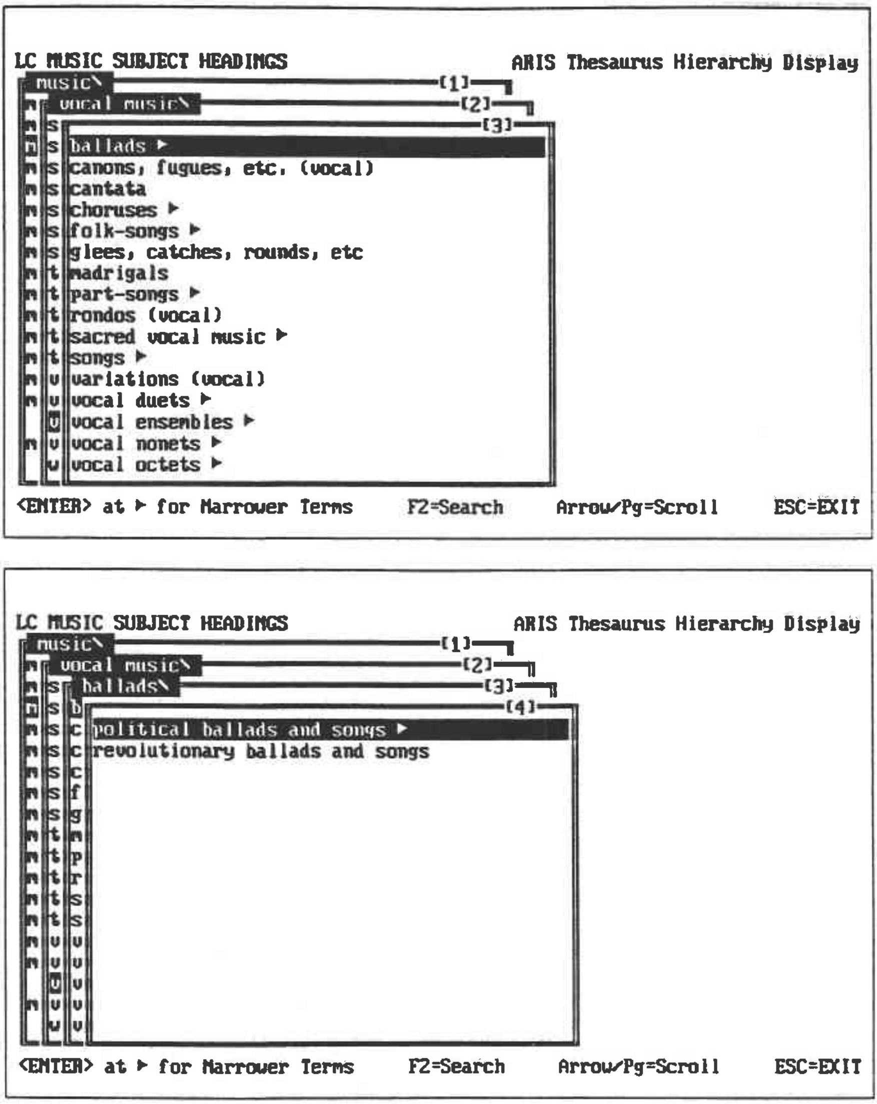
Figure 4c. Thesaurus Display: Record Linkage (First-, Second-, and Third-Generation Terms).



```
LC MUSIC SUBJECT HEADINGS                    ARIS Thesaurus Hierarchy Display
 music\ ---------------------------------[1]
   vocal music\ ---------------------------[2]
    ---------------------------------------[3]
    ballads ▸
    canons, fugues, etc. (vocal)
    cantata
    choruses ▸
    folk-songs ▸
    glees, catches, rounds, etc
    madrigals
    part-songs ▸
    rondos (vocal)
    sacred vocal music ▸
    songs ▸
    variations (vocal)
    vocal duets ▸
    vocal ensembles ▸
    vocal nonets ▸
    vocal octets ▸
<ENTER> at ▸ for Narrower Terms      F2=Search      Arrow/Pg=Scroll      ESC=EXIT
```

```
LC MUSIC SUBJECT HEADINGS                    ARIS Thesaurus Hierarchy Display
 music\ ---------------------------------[1]
   vocal music\ ---------------------------[2]
     songs\ ---------------------------------[3]
      ---------------------------------------[4]
      madrigals
      national songs ▸
      part-songs ▸
      political ballads and songs ▸
      prisoners' songs
      protest songs
      revolutionary ballads and songs
      sacred songs ▸
      satirical songs
      satirical songs (indirect)
      sea songs ▸
      shepherds' songs
      solo cantatas
      song cycles
      song-books ▸
<ENTER> at ▸ for Narrower Terms      F2=Search      Arrow/Pg=Scroll      ESC=EXIT
```

Figure 5. Hierarchical Display: Broad to Narrow.



```
LC MUSIC SUBJECT HEADINGS                    ARIS Thesaurus Hierarchy Display
 music\ ──────────────────────────────[1]──┐
m vocal music\ ─────────────────────────[2]──┐
m s ───────────────────────────────────[3]──┐
m s ballads ▸
m s canons, fugues, etc. (vocal)
m s cantata
m s choruses ▸
m s folk-songs ▸
m s glees, catches, rounds, etc
m t madrigals
m t part-songs ▸
m t rondos (vocal)
m t sacred vocal music ▸
m t songs ▸
m v variations (vocal)
m v vocal duets ▸
  v vocal ensembles ▸
m v vocal nonets ▸
  v vocal octets ▸
<ENTER> at ▸ for Narrower Terms     F2=Search     Arrow/Pg=Scroll     ESC=EXIT
```

```
LC MUSIC SUBJECT HEADINGS                    ARIS Thesaurus Hierarchy Display
 music\ ──────────────────────────────[1]──┐
m vocal music\ ─────────────────────────[2]──┐
m s ballads\ ───────────────────────────[3]──┐
m s b ──────────────────────────────────[4]──┐
m s c political ballads and songs ▸
m s c revolutionary ballads and songs
m s c
m s f
m s g
m t m
m t p
m t r
m t s
m t s
m v v
m v v
  v v
m v v
  v v
<ENTER> at ▸ for Narrower Terms     F2=Search     Arrow/Pg=Scroll     ESC=EXIT
```

Figure 6. Hierarchical Display (Variation of Search Shown in Figure 5.).

KWIC

```
                                        TENEBRAE service music
            graceland mansion (memphis, TENN.)
                             dwellings--TENNESSEE
                                        TENOR violin
                                        TENOR violin and continuo music
                                        TENOR violin and recorder music
                                        TENOR violin music
                           continuo and TENOR violin music
                           recorder and TENOR violin music
                               sonatas (TENOR violin and continuo)
                   suites (recorder and TENOR violin)
                    trios (harpsichord, TENOR violin, viola da gamba)
                                counter TENORS
                                        TEWA folk-songs
```

KWOC

- **TENN**
  - Graceland Mansion (Memphis, Tenn.)
- **TENNESSEE**
  - Dwellings——Tennessee
- **TENOR**
  - Continuo and **tenor** violin music
  - Recorder and **tenor** violin music
  - Sonatas (**Tenor** violin and continuo)
  - Suites (Recorder and **tenor** violin)
  - **Tenor** violin
  - **Tenor** violin and continuo music
  - **Tenor** violin and recorder music
    - USE Recorder and **tenor** violin music
  - **Tenor** violin music
  - Trios (Harpsichord, **tenor** violin, viola da gamba)
- **TENORS**
  - Counter **tenors**
- **TERMENVOKS**
  - **Termenvoks**
- **TERMINOLOGY**
  - Music——**Terminology**
- **TERRA**
  - Domini est **terra** (Music)
  - Dominus regnavit, exultet **terra**
    - USE Psalms (Music)——97th Psalm
  - Jubilate Deo omnis **terra**, psalmum dicite (Music)
    - USE Psalms (Music)——66th Psalm
  - Jubilate Deo omnis **terra**, Servite Domino (Music)
- **TESTING**
  - Musical ability——**Testing**
- **TEWA**
  - **Tewa** folk-songs
    - USE Folk-songs, **Tewa**

Figure 7a. Sampling of KWIC and KWOC Displays.

ANALYSIS

ARIS provides significant enhancements to the current print and online versions of *LCSH* for searching terms, tracking relationships among headings, and gaining an overview of LC music vocabulary. To demonstrate further these capabilities, a sample user query is chosen: "How do I find information on political songs?" The phrase "political songs" is searched in the alphabetical listing of the thesaurus display. The first, and only, heading containing these words is **Political ballads and songs**. By following its broader, narrower, and related branches, links to more than thirty associated terms are found. With varying degrees of specificity, at least twenty-four of these terms (listed below) bear direct relationship to the subject of "political songs" and could lead the user to broaden, narrow, or redirect this search.

POLITICAL BALLADS AND SONGS
ballads
campaign songs
emblems, national
folk songs
jody calls
lyric poetry
military music
music
music in the army
national music
national songs
patriotic music
patriotic poetry
poetry
political poetry
prisoners' songs
protest songs
revolutionary ballads and songs
revolutionary music
songs

topical songs
vocal music
war poetry
war songs

To generate this same list using the print version of *LCSH*, the user would be required to search each term separately—jumping from one location to another in the alphabet, while contorting to look backward, forward, and sideways for broader, narrower, or related terms. Similarly, in the online subject authority file, it is necessary to perform separate searches for each term chosen. Records contain only broader and related terms, not narrower terms. If a term has narrower terms, the broader term is displayed as a cross-reference in the alphabetical listing. For example, the RLIN subject authority file indicates that **Songs** has thirty-three narrower terms:

(xx Songs (33) (Broader term))

To determine which narrower terms belong to **Songs**, the record of each of the thirty-three narrower terms must be viewed. To sort through all the main and narrower term records necessary to finally assemble the twenty-four headings listed above would require many separate searches and no small amount of perseverance. Even if the user is patient and persistent enough to look at each individual entry in either the print or online version of *LCSH*, the overall picture lacks cohesion. The parts are present, but the path of their extended interconnection is not apparent. By contrast, in ARIS users can follow the development of logical paths, which they help shape, along existing physical trails within the vocabulary. They can move forward, retrace parts or the whole path, or take side trails—yet still, if they choose, remain connected to home-base, the original search term, **Political ballads and songs**. Another unique feature of ARIS is that both the hierarchical and thesaurus displays furnish a means by which the structure of *LCSH* can be analyzed. Not only can the organizational structure of LC music headings be examined, changes in that structure can also be made through ARIS. Links between terms can be changed or enhanced and

a
à
abbey
abiit
ability
abkhaz
aboriginal
abraham
abulas
acc
accentuation
accompaniment
accompaniments
accordeon
accordion
accordionists
accordions
acoli
acoustics
acrobats
act-tune
acting
action
ad
adaptations
adaption
adjutorium
advent
advertising
adyghe
adzhar
aemulari
aeolian
aeolian-vocalion
aeronautics
aesthetics
aeternum
aetherphon
afghan
afghanistan
africa
african
afrikaans
afrikaner
afro-american
afro-americans
after
afternoon
age
aged
agents
agnus
agri
agriculture
aid
aids
ainu
aka
akan
akkadian
ala
alabados
albanian
alboka
all
alla
allegory
alleluia
alleluja
allemande
allemandes
allen
allmayne
almain
almanacs
almand
alpenhorn
alpine
alteration
althorn
alto
altos
alyawarra
am
amateur
amati
ambo
amen
amens
america
american
americans
ampico
amusements
amusia
an
analog-to-digital
analysis
analytical
anatomy
ancient
and
andes
anecdotes
angels
angk

Figure 7b. Sampling of Display of Unique Words Found in LC Music Headings.

new terms—whether lead-in or newly authorized terminology—can be added and linked to existing vocabulary.

The headings associated with **Political songs and ballads** serve as a model for observation, reveal inconsistencies, and raise questions that might be representative of other term relationships in *LCSH*.

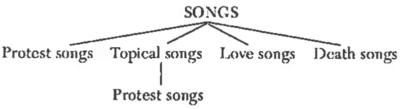
1. In some cases, obvious relationships between terms have been excluded. For example:
   Campaign songs
   BT: ——
   NT: Revolutionary ballads and songs

The broader term, **Songs**, is omitted from the record of **Campaign songs**. Likewise, **Campaign songs** is not listed as a narrower term in the record of **Songs**.

2. One term may have two or more broader or narrower terms, but the terms are not of equal scope. For example:
   Songs
   NT: Death songs
   NT: Love songs
   NT: Protest songs
   NT: Topical songs

Topical songs would seem to represent the broadest concept of any of these four narrow terms and is linked in *LCSH* as a broader term to **Protest songs**.

3. There are inconsistent hierarchical relationships among terms. The terms listed above provide a good example:



4. The difference between what is referred to as a "related term" and what might otherwise be considered a broader or narrower term is often not clear. For example:
   Military music
   RT: Music and war
   RT: Music in the army

Though more subjective, this case still raises questions. **Military music** might also be thought of as a broader term to **Music in the army** and a narrower term to **Music and war**.

5. If two terms are related, might there also be a connection between the individual broader, narrower, or related terms of those two? For example:
   War songs
   NT: Jody calls
   RT: Music in the army

Within *LCSH* there is no established connection between **Jody calls** (cadences to soldiers' songs) and **Music in the army**, but a conceptual relationship seems to exist.

6. Hierarchical relationships, from broad to narrow, are usually very shallow, which results in an enormous number of top terms and separate, unrelated hierarchies.

It is important to determine whether the observed shallowness is due to the absence of a natural link between terms, a lack of sufficient vocabulary, or structural inconsistency. Determining categories of and relationships among terms is a subjective intellectual process and as such should be considered more suggestive than prescriptive.

Even so, one of the next important steps in the development of the music thesaurus is to categorize existing terms into several broad primary facets representing the entire discipline of music. This is a process that will continue beyond the confines of the project funded by the Council on Library Resources.

Ultimately, the music thesaurus is designed to guide and facilitiate end-user searching. In its current stage of development, the ARIS music thesaurus provides a unique means of access to LC music headings and serves as a foundation for future developments of the structure and vocabulary of *LCSH* as well as for developments of the ARIS software.

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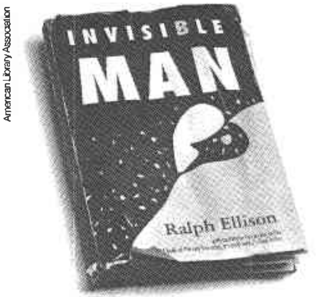
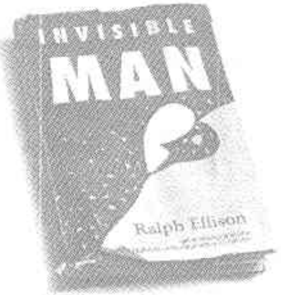
4. For additional information, contact ARIS: Anderson Rowley Information Systems, care of James D. Anderson, P.O. Box 38, New Brunswick, NJ 08903.
5. Perry Bratcher and Jennifer Smith, *Music Subject Headings Compiled from Library of Congress Subject Headings* (Lake Crystal, Minn.: Soldier Creek Pr., 1988).
6. *Music Cataloging Bulletin* 19, no.1–22, no.9 (Jan. 1988–Sept. 1991).


American Library Association

Going,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◆
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CatTutor: A Prototypical Hypertext Tutorial for Catalogers

Sarah E. Thomas

CatTutor[1] *is a hypertext tutorial for training catalogers developed by the National Agricultural Library (NAL) and its collaborators. The prototype covers the descriptive cataloging of computer files. Created in versions for the Apple Macintosh and for the IBM PC, CatTutor was tested by library school students and novice and expert catalogers during 1990 and 1991. CatTutor was found to demonstrate potential as a tool for training catalogers. Evaluators were enthusiastic about computer-assisted training and the machine-readable versions of the* Anglo-American Cataloguing Rules, *2nd edition, 1988 revision* (AACR2R) *and MARC format integrated in the program. To succeed, however, programs like CatTutor require an adequately automated environment, significant additions of content, and a carefully targeted audience.*

Whether cataloging is an art or a science has often been the subject of debate. What is not disputed, however, is that new catalogers require substantial training. Even in the 1990s, when librarians have ready access to rich bibliographic databases for sources of copy cataloging, bibliographic description and analysis remains an essential service in libraries. Original cataloging continues to play a large role at major universities and in the three national libraries, the Library of Congress, the National Agricultural Library (NAL), and the National Library of Medicine.

The exponential rise in the number of publications in recent decades virtually guarantees a constant, undiminished supply of works requiring original cataloging. In addition, not all copy cataloging is accepted without question. Variant cataloging practices from library to library can cause costly review and modification of other libraries' records.

Programs promoting shared cataloging have emerged as one means of containing the growth of original cataloging within an institution. The National Coordinated Cataloging Program (NCCP), for example, is a pilot project whose goals are to "implement a nationwide program for coordinated cataloging, to increase the speed and extent of cataloging coverage, and to reduce duplication of effort while maintaining national level quality."[2] In a shared cataloging environment, it becomes increasingly important that the one record from which all other libraries will derive their local cataloging must meet national standards and be readily accepted as high-quality cataloging.

One route to achieving consistent,

SARAH E. THOMAS is Director for Cataloging, The Library of Congress, Washington, D.C. No copyright is claimed on this note, which the author wrote as part of her official duties while employed at the National Agricultural Library. Manuscript received Feb. 4, 1992; revised May 29, 1992; accepted for publication June 5, 1992.

high-quality cataloging is to ensure that all catalogers receive the same training in the fundamentals of cataloging. Presently, graduate students in schools of library and information science usually learn the principles of cataloging as one aspect of a mandatory course in the organization of knowledge. Unless they take an advanced course geared specifically to bibliographic control, they emerge as graduates with more of a theoretical than a practical grounding in the subject.

Applied cataloging is usually learned on the job, with the traditional model for training newly minted catalogers being the one-on-one relationship of the apprentice and the master. The novice is instructed by a senior expert cataloger who revises every record produced by the trainee, introducing ever more complex materials for cataloging as the novice attains a solid footing in the fundamentals. Training and review often continue for at least one year, and can take longer. Obviously this approach to training is extremely labor-intensive and expensive. Cataloging administrators will frequently attribute declines in productivity to the reallocation of resources required for the training of new employees.[3]

One possible means of reducing the time devoted to training is the use of computer-assisted instruction (CAI). Recent studies have demonstrated the effectiveness of CAI in various training situations. Use of CAI allows students to proceed at their own pace, to skip over material in which they already have competence, and to repeat lessons as necessary. Evidence shows that the use of CAI speeds up the training process and improves the retention rate over traditional training methods. The most effective training appears to be a combination of approaches, uniting CAI and direct student-teacher interaction. O'Neill and Paris summarize the advantages of computer-based instruction, noting that CAI (1) reduces training time, (2) reduces reliance on trained instructors, (3) provides rapid update of instructional materials, (4) provides consistent high-quality instruction available on a large scale, (5) provides high-quality training at remote sites, (6) provides hands-on, performance-oriented instruction, and (7) permits individualization of instruction.[4]

Libraries have used CAI as an option in familiarizing patrons with their collections

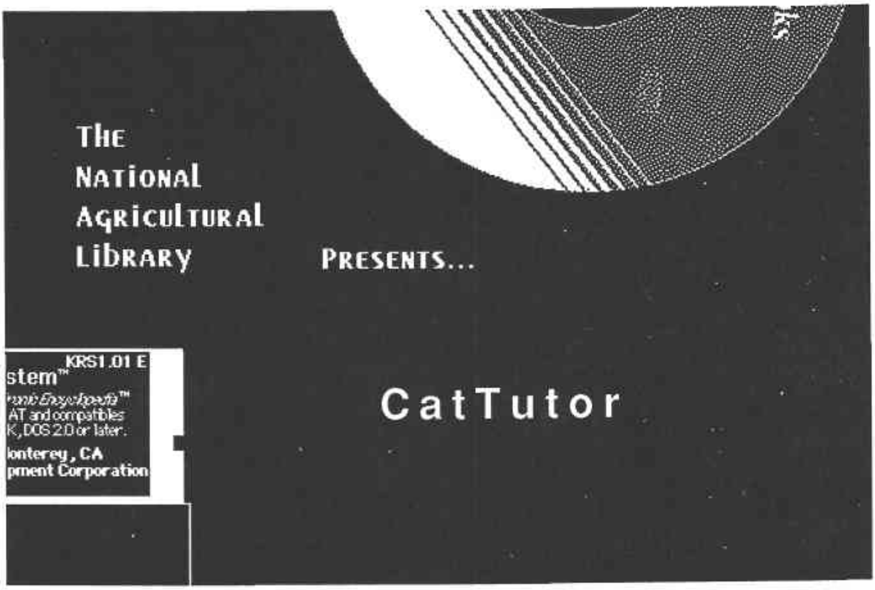


Figure 1. CatTutor Initial Screen.

and facilities. The University of Kentucky M. I. King Library introduced a successful CAI program to enhance its one-hour orientation session. Librarians found that CAI reduced some of the need to review basic library skills and allowed them to concentrate on more subject-specific tasks.[5]

The use of CAI is not widespread in the technical services area, although the development of expert systems for cataloging has been explored at several institutions.

BACKGROUND

To test the assumption that CAI would be a useful adjunct to traditional one-on-one cataloging training, the NAL and its collaborators developed a hypertext tutorial called CatTutor (see figure 1). The idea for the project germinated during the period when NAL, in cooperation with the Center for Instructional Development and Evaluation at the University of Maryland, was producing an interactive videodisc for training librarians and researchers in the use of the AGRICOLA database. AGRICOLearn trains users to search and retrieve items from AGRICOLA, employing a mentor figure to introduce concepts and simulating actual online searching. The possibility of creating an interactive videodisc for training catalogers was initially considered, but this idea was eventually discounted because of the expense associated with production of interactive videodiscs, the perceived difficulty in keeping the material mastered on the disc current, and finally, the lack of access to videodisc players in catalog departments. During this same time period the National Library of Medicine had created a user aid called MedTutor. A floppy disk product, MedTutor assisted users in learning to navigate Medline. The advantages it offered over a videodisc were numerous. It was an inexpensive medium, capable of being modified and refreshed without expensive remastering, and it could be used on a platform already widely established in libraries, the IBM-PC. As a consequence, the plan for CatTutor was altered to rest on a floppy base.[6]

COLLABORATION AND SUPPORT

Recognizing that the development of a computer-assisted instruction package for training catalogers was an ambitious undertaking, NAL sought external assistance. Several institutions and individuals indicated interest in the project: Ruth Carter, assistant director for Technical Services at the University of Pittsburgh; Michael Fitzgerald, chief cataloger at Harvard University's Widener Library; Ann Fox, Library of Congress; and Jennifer Younger, then director for Central Technical Services at the University of Wisconsin, Madison. NAL drafted a proposal for outside funding.

In 1988, NAL applied for an Apple Library of Tomorrow (ALOT) grant and became one of the original thirteen recipients in the ALOT program. As a result, NAL received support from Apple Computer, Inc., in the shape of an Apple Macintosh IIx, an Apple scanner, a LaserWriter II, and a bounty of software. ALOT also offered less tangible, but equally desirable, support in lending credibility and generating publicity for the endeavor.

Simultaneously, NAL approached the Council on Library Resources (CLR) for funding, first receiving a planning grant to specify requirements for the project more precisely, and in November 1989, receiving a significant award to develop a CAI program for cataloging.

DEFINITION

CatTutor, a hypertext training aid and reference tool, focuses on the descriptive cataloging of computer files. Included in the program are portions of the *Anglo-American Cataloguing Rules*, 2nd edition, 1988 revision (*AACR2R*); the MARC format for computer files; a glossary; five illustrative bibliographic records accompanied by instructional text; quizzes; and a mastery test.

OBJECTIVES

In proposing CatTutor, the NAL and its cooperators sought to develop a prototype that might advance the automation of the cataloging process and lead to an improvement in present training practice. Experience confirms that senior catalogers spend from several months to a year or longer training novice catalogers how to catalog according to local and national standards. A CAI program for training catalogers would potentially offer several advantages over traditional training. Students could proceed at their own pace and return to material they wished to review independent of time constraints imposed by a human trainer. Each student would have access to standardized instruction. Reliance on CatTutor would free the revisors from training in fundamentals and allow them to concentrate on more complex cataloging issues.

To achieve its overarching goal of training novice catalogers in the creation of bibliographic records for computer files, CatTutor aims to familiarize the user with the specialized vocabulary of descriptive cataloging and computer files; to link related concepts in standard reference tools to enhance access to these tools, thereby facilitating cataloging; to simulate an actual cataloging environment by providing the users with a graphic representation of the item being cataloged; and to lead the trainee through the creation of cataloging records.

DESIGN AND DEVELOPMENT

Participants in the project met at the NAL under a preliminary CLR grant in April 1989 to plan CatTutor's development. Initially, CatTutor was developed for the Macintosh, using equipment and software donated by Apple Computer through its ALOT award. CatTutor was limited in content to the descriptive cataloging of computer files because the project designers felt that a larger subject area could overwhelm the prototype.

Throughout the project, CatTutor participants consulted with instructional design experts for guidance about effective computer-assisted training. The participants agreed to identify relevant examples of different types of computer files and to create instructional scripts to accompany these examples. These scripts were programmed at NAL and were integrated with machine-readable files of reference material linked via hypertext. The resulting program

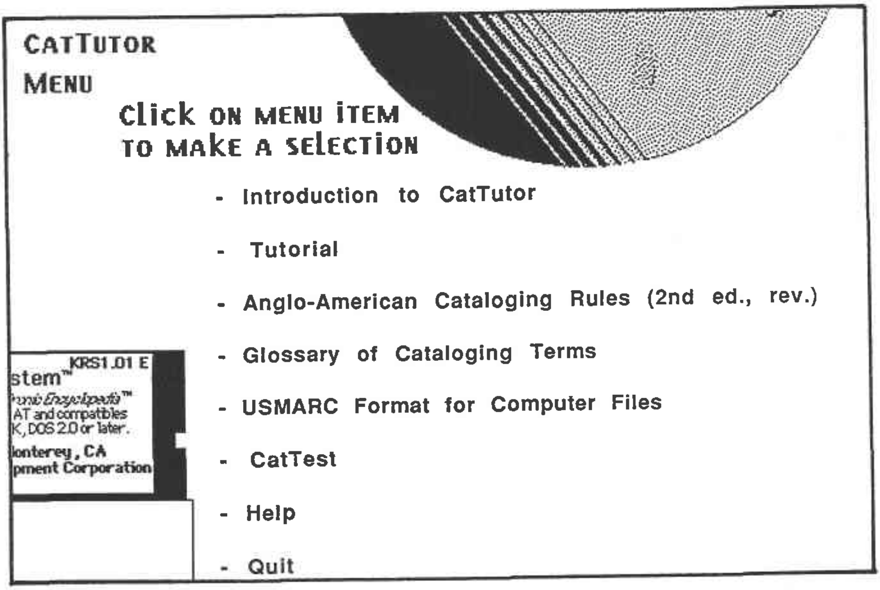
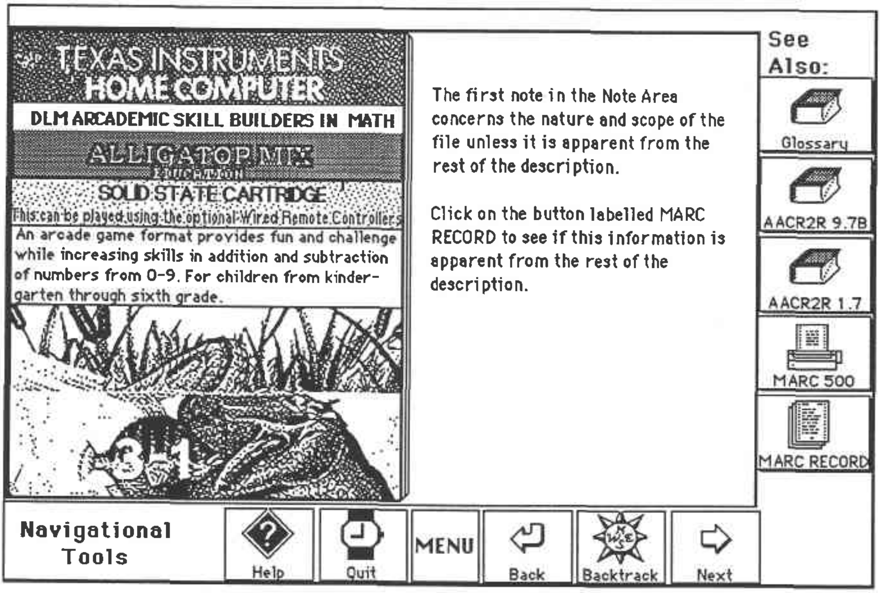

CATTUTOR
MENU
Click ON MENU ITEM TO MAKE A SELECTION
- Introduction to CatTutor
- Tutorial
- Anglo-American Cataloging Rules (2nd ed., rev.)
- Glossary of Cataloging Terms
- USMARC Format for Computer Files
- CatTest
- Help
- Quit
KRS1.01 E
stem™
AT and compatibles
K, DOS 2.0 or later.
lonterey, CA
pment Corporation

Figure 2. Menu Screen.



An arcade game format provides fun and challenge while increasing skills in addition and subtraction of numbers from 0-9. For children from kindergarten through sixth grade.

The first note in the Note Area concerns the nature and scope of the file unless it is apparent from the rest of the description.

Click on the button labelled MARC RECORD to see if this information is apparent from the rest of the description.

Figure 3. Tutorial Screen.

was reviewed by participants for accuracy and ease of use. Screen design and other user interface features were improved through consultation with a HyperCard expert.

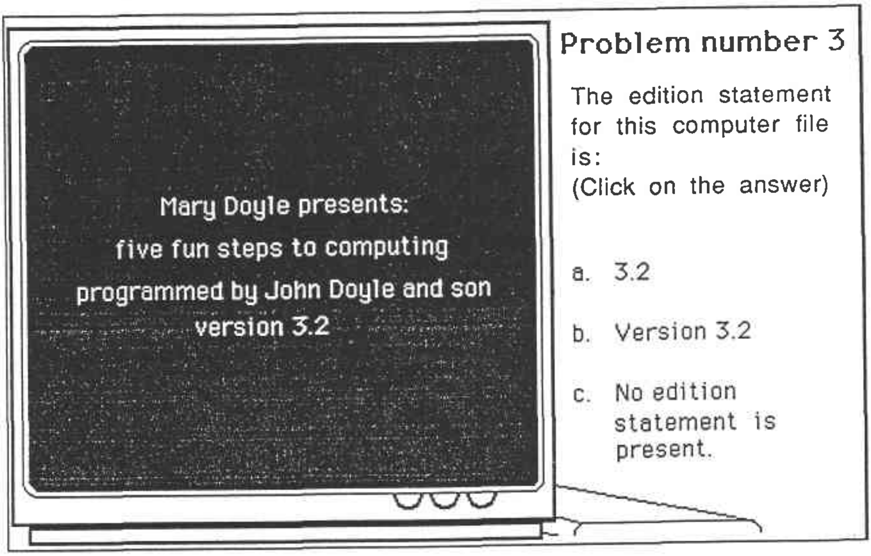
The tutorial was created by selecting different types of computer files, such as floppy, cassette, CD-ROM, and cartridges, and proceeding step by step in their description through the application of the appropriate rules and guidelines, referencing *AACR2R* and the OCLC MARC format for computer files. The user has the option of working through the creation of a bibliographic record from start to finish or studying only particular elements, such as title proper or physical description, of each of the five examples (see figure 2). Each screen in the tutorial contains a graphic representation of the item selected for cataloging, instructional text, links to full-text portions of key reference tools, and a link to the MARC-tagged cataloging record as it would appear at that stage of development (see figure 3). The user also has access to a glossary of terms, navigational aids, a "help" module, and the option of quitting the program.

At predetermined intervals, the trainee must enter cataloging data into a simulated MARC record. If the novice correctly enters the data, the MARC record is updated, and the trainee continues the tutorial. If the data are incorrect, the system prompts the trainee to try again. After a second incorrect attempt, the system supplies the correct information. At the completion of each record, the program offers the option of a quiz that assesses whether the student has mastered the essence of the lesson (see figure 4).

TECHNICAL CONSIDERATIONS

CatTutor was initially programmed to run on a Macintosh IIx with an 80-megabyte hard drive and 4 megabytes of RAM. Extensive use of HyperCard was made in linking related concepts. NAL's Claudia Weston served as the primary knowledge expert and the principal system architect. When the project commenced, she had virtually no experience with the Macintosh. Working approximately half-time for fifteen months, she was able to complete the CatTutor program. Using scripts she created or those submitted by NAL's collaborators, she produced over 2,000 cards in thirteen stacks.

Chapters 1 (general rules for descriptive



Mary Doyle presents:
five fun steps to computing
programmed by John Doyle and son
version 3.2

Problem number 3

The edition statement for this computer file is:
(Click on the answer)

a. 3.2

b. Version 3.2

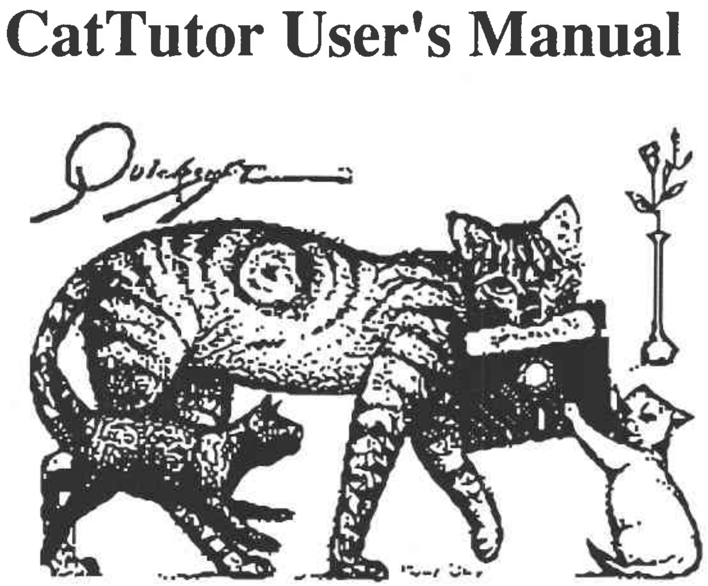
c. No edition statement is present.

Figure 4. Lesson Quiz.

cataloging) and 9 (rules for computer files) from *AACR2R* were scanned from the published version using the Apple scanner. Permission to use *AACR2R* for the experimental product was obtained from ALA. Portions of the OCLC MARC format for computer files were also scanned. In some cases, the initial scanning was illegible because the point size of the printed text was too small to be captured. To circumvent this problem and avoid rekeying, Weston photocopied the text, enlarged it, and then scanned the enlarged version. She also cut and pasted the graphics using original materials from the pieces being used as examples whenever possible. Thus, the cover of the manual from the title *Alligator Mix* was scanned, and the portions of the text that did not reproduce adequately were keyed in separately. Permission to use all examples in the tutorial was requested from all the software producers. For instance, the cover graphic for the manual is derived from a drawing created by Quicksoft (see figure 5).

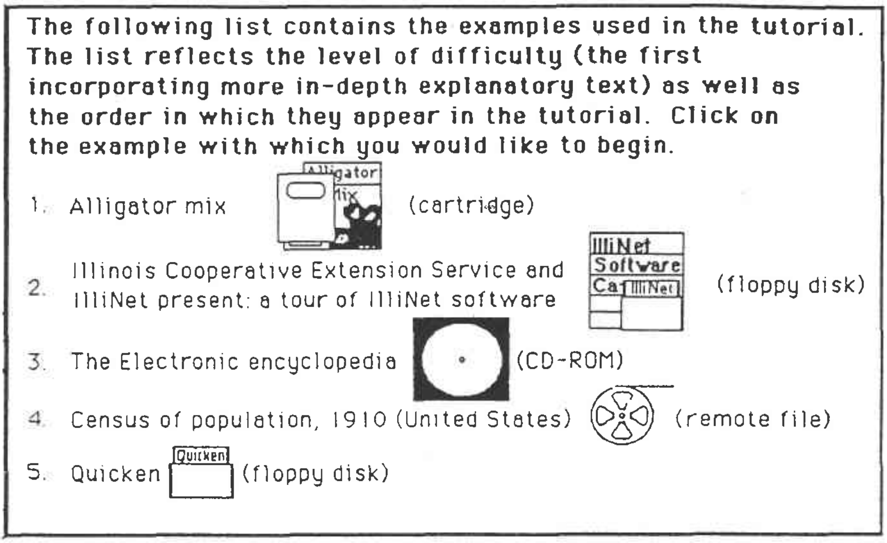
Many technical and design decisions had to be made. Although the project investigator had lobbied for ten examples, the preparation of the content was so labor-intensive that five was the maximum number that could be achieved. Icons were drawn, and screen design was reviewed by the CatTutor participants. Agreement on the accuracy of the cataloging and the instructional text had to be reached. A particularly annoying problem that was never satisfactorily resolved was the matching of the trainee's keyed response with the correct answer. Because of programming time constraints, the capability to distinguish between upper and lower case could not be programmed successfully in this HyperCard version, and an incorrect response could be identified as accurate. The computer was unforgiving about spacing and punctuation, and feedback was not provided on why the respondent's answer was wrong. Initially, so much instruction text was provided that first reactions to CatTutor were that the screen was cluttered and the language verbose. Subsequent versions became more streamlined and the text more terse.

Another design issue that surfaced was the multilayered, nonlinear opportunity offered by HyperCard, which allows the user to move from concept to concept by the use of buttons. If one disregards the use of indexes and tables of contents, traditional textbook training is usually linear,



CatTutor User's Manual

Figure 5. User's Manual Cover. The manual was developed by The National Agricultural Library in conjunction with the University of Pittsburgh and the University of Wisconsin–Madison.

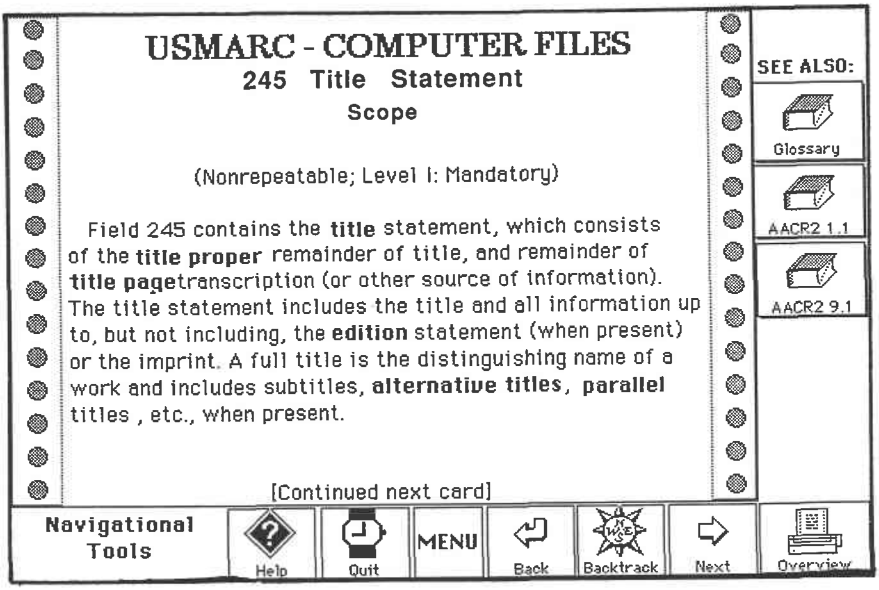


The following list contains the examples used in the tutorial. The list reflects the level of difficulty (the first incorporating more in-depth explanatory text) as well as the order in which they appear in the tutorial. Click on the example with which you would like to begin.

1. Alligator mix (cartridge)
2. Illinois Cooperative Extension Service and IlliNet present: a tour of IlliNet software (floppy disk)
3. The Electronic encyclopedia (CD-ROM)
4. Census of population, 1910 (United States) (remote file)
5. Quicken (floppy disk)

Figure 6. Tutorial—Menu Card for Complete Record.

and in CatTutor, the five examples were progressively more difficult. Explanatory text was greatest in example number one, and barely present in example five (see figure 6). However, if a student were to exploit the nonlinear capability inherent in HyperCard, he or she would sacrifice some content. In the prototype, this con-



USMARC - COMPUTER FILES

245 Title Statement

Scope

(Nonrepeatable; Level I: Mandatory)

Field 245 contains the **title** statement, which consists of the **title proper** remainder of title, and remainder of **title page**transcription (or other source of information). The title statement includes the title and all information up to, but not including, the **edition** statement (when present) or the imprint. A full title is the distinguishing name of a work and includes subtitles, **alternative titles**, **parallel** titles , etc., when present.

[Continued next card]

Figure 7. CatTutor MARC Record Display.

flict was left unresolved, but patterns of use were tracked during the evaluation to aid in future instructional designing.

An early criticism by noncatalogers (instructional designers and HyperCard experts) was that CatTutor was dull. Although some might protest that this is the nature of the subject matter, efforts were made to relieve the monotony by breaking up the examples with quizzes, which turned out to be a popular feature, and by adding audio approbation in the form of crowd applause when the quizzes were correctly answered. This latter enhancement was relished during demonstrations, but lacked staying power for actual catalogers testing CatTutor.

The area of the screen available for the tutorial was rather limited in the final version of CatTutor, having been developed to fit on a standard Macintosh Plus or Macintosh SE nine-inch, 512 × 342-pixel monochrome monitor. Using state-of-the-art Apple hardware and software, it would today be possible to enlarge the size of the area for text and graphics considerably. However, the designers decided to stick with the smaller area, despite its corresponding restrictions on amount of text and graphics that could be displayed, because most installations would not yet have the larger screen installations.

One key asset that helps the user differentiate texts (*AACR2R* from MARC from instruction) is color. In the HyperCard application, color was not an option. As a consequence, other orientation signposts, such as position on the screen and font, were used. The MARC format was given a visual cue of a computer paper tractor feed border, whereas an attempt was made to replicate the familiar layout and typography of *AACR2R* for that text (see figure 7). The MARC record simulated OCLC's MARC record display, and the glossary consistently displayed the terms in bold characters followed by the definition.

Since many potential users of CatTutor have access to IBM PC-compatible technology rather than Apple equipment, CatTutor was also planned to be PC-compatible. The project investigator hoped to identify a software package that would allow translation of Hypercard scripts to the PC environment. Several packages were reviewed, and ultimately Spinnaker's PLUS was selected. The transition was not seamless, and considerable reprogramming was required. However, the reprogramming also enabled the programmer to improve the basic design of CatTutor. Where the Apple version was monochrome, the PC version was in color. Since PLUS operates in a Windows 3.0 environment, other enhancements were also possible. Instead of toggling back and forth between screens showing *AACR2R*, the MARC record, and the instructional text, it was feasible to display them simultaneously using Windows. On the other hand, as a result of the negative response of the Macintosh CatTutor evaluators, the audio portion of CatTutor was dropped from the PC version. Another key difference between the Apple and PC versions is speed. In the conversion to the PC, some immediacy of response is sacrificed.

A print manual was written to accompany CatTutor. The manual provides instructions for loading the CatTutor files, system requirements, and an overview of the program. Designed to complement CatTutor, the manual also accommodated the need of computer-anxious students to have a more familiar means of introduction to the tutorial.

The final version of CatTutor is programmed to run on either Macintosh or IBM PC-compatible equipment. The Apple version requires a Macintosh computer with at least 1 megabyte of RAM, a hard drive with at least 3.5 megabytes of free memory, a 3.5-inch double-sided double-density floppy drive, and HyperCard (Version 1.2.2). The IBM PC-compatible version requires an 80286 or higher compatible PC, 2 megabytes of RAM (4 megabytes highly recommended), a hard drive, a 1.2-megabyte floppy drive, Windows 3.0, a color monitor, and a mouse.

MACINTOSH CATTUTOR EVALUATION

CatTutor for the Macintosh was tested by staff at NAL in September 1990. Revisions incorporating changes originating from the preliminary evaluation at NAL were made. CatTutor was subsequently field-tested in November at NAL, the University of Pittsburgh School of Library & Information Science, and the University of Maryland College of Library and Information Service. Instructional design experts developed evaluation tools to measure CatTutor's effectiveness, interviewed CatTutor users on site, and analyzed data recovered from a trace built into the program. A control group took a pencil and paper test for purposes of comparing effective learning. A report summarizing this analysis was completed in February 1991 and submitted to the CLR as part of the final report on CatTutor.

IBM PC-COMPATIBLE CATTUTOR EVALUATION

Based on feedback from the November 1990 evaluation, a number of changes were made that enhanced the user's navigational capabilities. Following internal review of CatTutor by the participants, a new evaluation instrument was designed by the instructional design consultant to be used to measure CatTutor's effectiveness and user satisfaction with the program. Arrangements were made to test CatTutor at Kent State University School of Library Science, and libraries at Ohio State University, the University of California at Berkeley, and the University of Wisconsin, Madison. As in the case of the Macintosh-based CatTutor, on-site interviews were conducted, and a pen-and-paper test was given to a control group. The data collected, including transcriptions of interviews, were analyzed in the July 1991 report submitted to the CLR as part of the final report on CatTutor.

ASSESSMENT

Based on the experience of the project designers, the participant reviewers, test subjects, and others who used CatTutor or saw it demonstrated, several conclusions may be drawn. First, CatTutor represents a significant effort in the advancement of automation support for cataloging. However, a considerable investment of time by knowledge engineers and programmers was required to develop the prototype. A rough estimate of time expended on the project is 4,000 hours of mostly professional time. The minimum dollar investment for CatTutor is calculated at $125,000. To improve the prototype to the point that it could be used as an effective tool in libraries or library schools would require many additional hours. To create a tutorial that would cover the spectrum of cataloging training, including descriptive cataloging of formats other than computer files, subject analysis, classification, and authority work, would require a major commitment.

Analysis of the CatTutor experiment suggests that most cataloging departments do not currently possess adequate technological resources for full exploitation of CatTutor or similar products. In the ideal configuration, CatTutor was envisioned as residing on a cataloger's personal workstation as a permanent reference tool. In the test libraries, CatTutor was used in isolation from daily routine, and library hardware often lacked sufficient memory to accommodate the program. Catalogers did not always have individual workstations, and not all of the existing workstations had color monitors. Those evaluating CatTutor were more often then not unfamiliar with the use of a mouse, inhibiting the effective use of the program. To be most useful, CatTutor or a similar reference tool would be integrated into the cataloger's workflow, with information capable of being accessed during creation of an actual record. Catalogers often lack state-of-the-art hardware and resources for software such as Windows, a situation that hampers acceptance of computer-based training.

From the conception of CatTutor, a persistent query was for whom was it being designed, or more accurately, what was the definition of a novice cataloger. CatTutor's creators begged this question, testing the program with paraprofessionals, library school students, novice catalogers, and experienced catalogers unfamiliar with computer files. The first three categories often found CatTutor lacked sufficient detail but was too complex, whereas experienced catalogers recommended the excision of basic material from the program. Either the program must be redesigned to create different paths for different levels of expertise, or it must be directed at a single type of user. Further research should be conducted on what constitutes a novice cataloger as opposed to an experienced one. In sum, CatTutor's audience must be clearly defined.

A further conclusion questions the very premise of CatTutor in the changing perspective on what cataloging should be. CatTutor attempts to provide an alternative to traditional training, and within the framework of CAI, it offers an innovative approach that demonstrated reasonable success. However, it may be necessary to rethink radically the content of all cataloging training and rules. Perhaps an equally valid experiment would be stripping training to the bare essentials and teaching people to follow principles, rather than to memorize detailed instructions.[7]

Finally, and despite the aforementioned tempering factors, there is enormous interest in a product such as CatTutor, both as a tutorial that might alleviate some of the heavy burden of staff training and as a machine-readable reference tool. Librarians are very keen on having online access to *AACR2R*, the *Library of Congress Rule Interpretations*, and other key works to facilitate the cataloging process. Catalogers, library educators, and administrators from all over the United States, Canada, and the United Kingdom have requested copies of CatTutor for review and use. The designers of CatTutor have received several invitations to demonstrate the program at conferences and meetings. There is evidence of a need and a desire to improve on the present labor-intensive training method through the use of automation.

RECOMMENDATIONS

In reviewing their experience with CatTutor, the project participants made three key recommendations. First, to stimulate the further development of automated tools that benefit the cataloging process, CatTutor should be widely distributed. As a consequence, a free copy of CatTutor can be obtained from the NAL.[8] Eventual plans call for CatTutor to be made available over the Internet for downloading via file transfer protocol. Second, the group recommended that the CLR and other organizations continue to support projects that advance current bibliographic processing through automation, such as the development of expert systems, cataloger's workstations, and a machine-readable *AACR2R*. Last, the CatTutor producers urged catalogers and library administrators to continue to review cataloging rules and procedures. Innovation is essential to produce bibliographic records that reflect true access needs and that can be produced in a timely fashion. One of the consequences of such action would be the simplification of training and an increase in productivity.

REFERENCES AND NOTES

1. CatTutor was made possible through an Apple Library of Tomorrow grant from Apple Computer and generous support from the Council on Library Resources. Sarah E. Thomas, Associate Director for Technical Services, served as project coordinator. Claudia V. Weston, NAL, coauthored, designed, and programmed CatTutor. Shirley Souder, NAL, assisted in this endeavor. A project review group met to suggest revisions and recommend additional examples. Members of this group were Ruth Carter and John Sluk, University of Pittsburgh; Ann Fox, Library of Congress; Michael Fitzgerald, Widener Library, Harvard University; Carol Mueller, University of Wisconsin, Madison; Jennifer Younger, Ohio State University; and Linda Robinson and Liz Bishoff, OCLC. Robert Houghton, University of Arkansas, and Ann DeVaney and Lenore Kirby, University of Wisconsin, Madison, provided instructional design expertise. Screen design consultation was done by Ann Bevilacqua, Upper Broadway Bodega. Acknowledgments also go to Lucia Rather, formerly of the Library of Congress; Warren J. Haas, formerly of the CLR; Steve Cisler, Apple Computer; and Joseph H. Howard, NAL, for their instrumental encouragement and support in the development of CatTutor.
2. "NCCP Pilot Program Is Implemented," *Library of Congress Information Bulletin* 47:291 (1989).
3. The training and education of librarians has been examined by a number of leading educators and practitioners whose papers have been published in *Cataloging & Classification Quarterly* 7, no.4 (Summer 1987). Proceedings of a symposium on the recruitment, education, and training of catalogers, held at Simmons College, Boston, Mass., March 9–10, 1988, also shed light on this topic. See Sheila S. Intner and Janet Swan Hill, eds., *Recruiting, Educating, and Training Cataloging Librarians: Solving the Problems* (New York: Greenwood, 1989).
4. Harold F. O'Neill, Jr., and Judith Paris, "Introduction and Overview of Computer-Based Instruction," in *Computer-Based Instruction: A State of the Art Assessment* (New York: Academic Pr., 1981), p.3.
5. Rob Aken and Laura Olsen, "Computer-Assisted Instruction in Academic Libraries," *Journal of Computer-Based Instruction* 13:94 (1986).
6. Duane Arenales, chief, Technical Services Division, National Library of Medicine, personal communication.
7. Dorothy Gregor and Carol Mandel, "Cataloging Must Change!" *Library Journal* 116, no.6:42–47 (Apr. 1, 1991).
8. A free copy of CatTutor can be obtained by sending five 3.5-inch double-sided double-density floppy diskettes for the Macintosh version or two 5.25-inch 1.2-megabyte floppy diskettes for the IBM-PC version to Claudia V. Weston, USDA, NAL, TSD, Room 100, 10301 Baltimore Blvd., Beltsville, MD 20705-2351.

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Association for Library Collections & Technical Services Annual Report, 1991–92

The past year was one of growth, planning, and change, and there is far too much to say in the space allotted.

A key area of activity concerned library materials preservation, including a disaster preparedness institute, preparation of a new edition of *A Core Collection in Preservation,* making the ALA Preservation Policy available at the White House Conference on Library and Information Science, and passage of a resolution by the ALCTS Board of Directors urging ALA Graphics to print bookmarks on alkaline paper.

The work of the Organizational Structure Task Force significantly accelerated, with an outline plan presented for comment at Annual Conference. The Task Force will bring forward before Midwinter a draft final report.

ALCTS circulated draft NISO standards on topics such as permanent paper, U.S. microform publishing statistics, order forms for multiple titles, representing languages for information interchange, and CD-ROM mastering. At Midwinter the ALCTS Board forwarded to NISO a draft standard on packaging and labeling of videocassettes for consideration as an American National Standard.

During the year we continued our strong continuing education efforts. There were three successful preconferences sponsored at the Annual Conference in San Francisco on "Electronic Data Interchange and the Library," "Implementing USMARC Format Integration," and "Library Buildings and Preservation." Regional institutes concerned collection management and development, Dewey Decimal Classification, serials management, and disaster preparedness.

Annual Conference programs were highly successful. The 1992 ALCTS President's Program, "After the Electronic Revolution Will You Be the First to Go?" focused on the effects of electronic publishing and networked information. The keynote speaker was Theodor Nelson (Xanadu Worldwide Publishing Repository Network), and other speakers included Thomas Duncan (University of California at Berkeley), Susan K. Martin (Georgetown University), and Peter Graham (Rutgers University). Work is underway to seek publication of the papers.

The association attempted to plot a new course concerning systems, structures, and standards for information access for the twenty-first century. The Council on Library Resources (CLR) did not fund the proposed invitational conference, but alternative ideas and funding are being sought.

The *ALCTS Network News* (or *AN2*) celebrated its first anniversary, and now has over 1,600 subscribers. *AN2* reflects the ongoing commitment of ALCTS to keep the division at the leading edge and to be responsive to member needs. This year *AN2* received much attention as it became the first source of information for some fast-breaking ALA stories. The *ALCTS Newsletter* experimented with new formats and began developing an editorial policy. The ALCTS Board approved a new editorial policy statement for *Library Resources & Technical Services* (*LRTS*) that recognized the importance of publishing both scholarly and practical articles. Monographic publishing also proceeded at a healthy pace, with four books published by ALA Publishing on behalf of ALCTS.

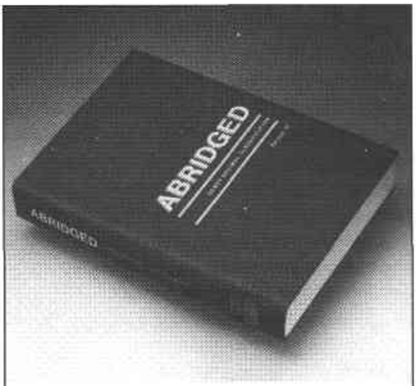
Richard M. Dougherty, Carol A. Hughes, and Cal Gough were the winners of the ALCTS/Blackwell North America Scholarship Award, which was awarded to two different library schools. Karen A. Schmidt received the Best of *LRTS* Award.

The budget of the division remained strong. We added to our endowment during the year, and the fiscal year will result in an effective net balance.

ALCTS also maintained a strong presence in legislative and intellectual freedom activities. ALCTS sponsored three resolutions, all of which were passed by ALA Council, that opposed taxation of serial subscriptions, of other types of library materials, and of publishers' book inventories.

ALCTS committees also continued to make important contributions during the year. For example, the Catalog Form and Function Committee investigated the impact of technology in providing bibliographic control. Two important new discussion groups formed, one on Electronic Publishing and the other on Creative Ideas in Technical Services. The Scholarly Communications Committee met for the first time and began exploring how to extend communication to the scholarly community. The Technical Services Costs Committee revised its charge and was renamed the Technical Services Output Measures and Costs Committee.

I believe we have much of which to be proud both substantially and substantively. I thank you, the members of ALCTS, for affording me with the opportunity to serve the association during the past year as the President of ALCTS.—*Arnold Hirshon, President*.



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Book Reviews

Lawrence W. S. Auld, Editor

Budgets for Acquisitions: Strategies for Serials, Monographs, and Electronic Formats. Ed. by Sul H. Lee. New York: Haworth, 1991. 134p. $22.95 (ISBN 1-56024-158-6). LC 91-12603. Also published as *Journal of Library Administration* 14, no.3 (1991).

Library Material Costs and Access to Information. Ed. by Sul H. Lee. New York: Haworth, 1990. 114p. $19.95 (ISBN 1-56024-146-2). LC 91-12604. Also published as *Journal of Library Administration* 12, no.3 (1990).

These slim volumes, which contain papers presented in 1989 and 1990 with the general theme of "The Impact of Rising Costs of Library Materials on Access to Information," provide a cohesive treatment of that issue. Although the books' contributors possess a research library perspective, the data and the ideas presented are of interest and benefit to the entire profession, especially academic librarians. The only time this perspective narrows to a point of no help to anyone is when a university administrator tries to explain electronic media.

One might want to read these essays straight through not only to get a flavor of the conferences but also to get a full sense of the problems facing library budgets and the complexity of these problems. We tend to see and discuss serials prices, for example, in rather simplistic terms both in stating the problem and in suggesting solutions. These papers show the complexities while suggesting some approaches to take in dealing with, if not solving, these serious problems.

The advantage of published papers over oral presentations is that the written versions allow us to review the text, analyze points, and apply useful elements to our own institutions and situations. These are important papers that merit preservation.

Thomas W. Shaughnessy's paper, "The Library as Information Center: Wishful Thinking or Realistic Role?" in *Library Material Costs and Access to Information* admirably sets the stage for what follows in the rest of this book and the next as well. After detailing some trends, Shaughnessy lists ten things that librarians need to do to strengthen their positions on campuses, to make the most of what they have, to move with change (or maybe slightly ahead?)—in short, to be entrepreneurs and not let reduced and competing funds hinder us in fulfilling our missions. This is a compelling essay that takes a fresh approach to a long-discussed issue. The other essays provide some useful data, but more importantly, they provide strategies for budgeting, planning, and laying a proper political groundwork in support of the library's needs.

In the companion volume, *Budgets for Acquisitions*, Chuck Hamaker's essay also is worth singling out because of his analysis of the systemic problem that confronts us. His work with serials and book pricing and with use of those materials provides him a unique position from which to present issues for us to consider, and he does it with good, zestful writing.

Other essays in this volume deal with the competition between serials and monographs for funds and remind us that book prices have increased as much as those of serials in recent years. Two essays deliberate on how to divide up the library budget, and two others deal with collection development and analysis.

We have been talking about these

issues—serials and book prices, access versus ownership, the changing role of libraries, electronic formats, cooperative collection development—for as long as we have had library literature. We need to continue our discussions and we need articulate voices to help us resolve these problems. This University of Oklahoma series, put together with care and vision by Sul H. Lee, is an important addition to the literature. Let us hope that Mr. Lee continues the conferences, because, if he does, we will continue to be enriched.—*Thomas W. Leonhardt, University of the Pacific, Stockton, California.*

The National Research and Education Network (NREN): Research and Policy Perspectives. By Charles R. McClure, Ann P. Bishop, Philip Doty, and Howard Rosenbaum. Norwood, N.J.: Ablex, 1991. 744p. paper, $95 institutional, $45 personal (ISBN 0-89391-813-X). LC 91-14028.

National information policy is presently at its most significant crossroads in U.S. history. Development of the National Research and Education Network (NREN) appears imminent, promising to revolutionize access to information at all levels of society.

The NREN is proposed as part of an overall Federal High Performance Computing (HPC) program aimed at increasing U.S. productivity and competitiveness in industry, research, communications, and information management. The NREN's role in the proposed HPC program is to facilitate collaboration among researchers in government, industry, and higher education via a high-speed, user-friendly computer network. The NREN is intended to build on the existing Internet, which lacks the uniformity, speed, and widespread availability necessary to truly interconnect the nation.

No NREN-related stone is left unturned in this exhaustive work. The information contained in it is current through February 1991. Roughly half the book consists of extensive literature reviews, reports of research related to computer networks conducted at Syracuse University, and analysis of policy issues related to the NREN. The other half contains full texts of proposed legislation, proceedings of government hearings, and several government reports (the latter are quite interesting reading). The authors trace the development and impact of U.S. electronic research networks since the inception of the Department of Defense-funded ARPANET in 1969.

From those beginnings, scientific and scholarly communication has become fragmented among more than one hundred large networks. A unified, high-speed network such as the NREN seems essential. As the authors point out, however, many questions still need to be studied before we launch the NREN, such as, How large should the NREN be? Who will develop network standards? Should the NREN be regulated? How will security be maintained? Will benefits to researchers show significant improvement? Such questions are addressed in scholarly detail in this volume.

One of the most important questions related to the NREN, however, receives rather short shrift in this book. Predominant opinion holds that federal involvement in the NREN would eventually be replaced by the commercial sector. However, the potential implications of this arrangement, such as equal-access issues, cost, the threat of monopoly, and continued access to less "profitable" information resources, are barely discussed. These questions should be of special interest to American librarians, who view themselves as champions of information accessibility.

The book is supplemented by author and subject indexes, and key points are summarized in concise tables interspersed throughout. This work would be most useful in an academic library or research institution yet would not be out of place in a public library. The sheer volume of information available on the topic of electronic networks and the proposed NREN is astounding, and this work does an excellent job of distilling and organizing this information into an extremely informative yet readable book.—*Christina Sokol, WLN Bibliographic Information Services, Olympia, Washington.*

Olderr's Fiction Subject Headings: A Supplement and Guide to the LC Thesaurus. By Steven Olderr. Chicago: American Library Assn., 1991. 147p. $27.50; ALA member $24.75 (ISBN 0-8389-0562-5). LC 91-8679.

Olderr deplores the minimal use of *Library of Congress Subject Headings* (*LCSH*) for fiction, which diminishes the public's access to these works. To facilitate proper application of these headings, he explains with extensive scope notes subject headings from *LCSH* that are appropriate for fiction, most of which require the subdivision FICTION. For example, listing MUGGING he explains how it differs from ROBBERY, BRIGANDS AND ROBBERS, STEALING, LARCENY, THIEVES, BURGLARY, and OUTLAWS. He provides many cross-references to increase the likelihood that an appropriate subject heading will be found. Only when the subject heading from *LCSH* inadequately describes the material does he advocate application of one of his own subject headings, which he indicates with a backslash (\). Olderr claims that his headings, like KNIGHTS AS DETECTIVES or LEGISLATORS AS DETECTIVES, follow *LCSH* in alphabetization and are fully congruent with it.

Olderr urges adoption of the American Library Association's Subject Analysis Committee's (SAC) *Guidelines on Subject Access to Individual Works of Fiction, Drama, Etc.* (appendix A of this book) even if the Library of Congress cannot use them. Library of Congress policies for fiction subject headings (appendix B) are restrictive and are used primarily in cataloging fiction collections. For example, the Library of Congress suggests fiction subject headings only for historical or biographical individual works or for animal stories, and advises against subject headings not made explicit by the author. Olderr goes farther than the SAC *Guidelines* when he calls for subject access by chronological setting and treatment in addition to topic, genre, characters, and geographical setting proposed by the SAC *Guidelines*. Also, unlike the SAC *Guidelines*, when Library of Congress genre headings prove inadequate, he lists under FICTION his own genre headings like EPIC NOVELS, DIALECT FICTION, BEAT FICTION, and SATIRICAL FICTION.

Olderr claims to list and explain problematical subject headings from his earlier works, but what criteria does he use to select certain Library of Congress headings and to exclude others? Why select MARSHALS, not MARSHES, or JESUITS, not JET PLANES? Also, his subtitle is misleading. When he refers to the LC Thesaurus, some readers might assume that he refers to a separate publication rather than *LCSH*, the "red books."

Because the Library of Congress does not do in-depth fiction cataloging, many catalogers have followed this precedent and use few subject headings for fiction. Then, too, many cataloging departments may not have either the time or the space to give fiction the coverage suggested by Olderr. If the Library of Congress adopted or recommended that libraries adopt the fiction guidelines proposed by the Subject Analysis Committee, many cataloging departments might be encouraged to provide more fiction access and would probably be further encouraged to use Olderr's supplement. As Olderr states in his introduction, cataloging departments must at first determine how much coverage they wish to give fiction. For libraries that wish to offer more fiction coverage, Olderr's book is the most useful cataloging aid available, and its use as a supplement to *LCSH* would improve patron access to fiction.—*Robert T. Ivey, Memphis State University, Tennessee.*

Performance Analysis and Appraisal: A How-to-Do-It Manual for Librarians. By Robert D. Stueart and Maureen Sullivan. How-To-Do-It Manuals for Libraries, no.14. New York: Neal-Schuman, 1991. 174p. paper, $35 (ISBN 1-555707-061-6). LC 91-17288.

Stueart and Sullivan stress the importance of employees as assets to be managed for the long-term benefit of an institution. Wise performance evaluation can contribute to employee development and institutional productivity. This manual provides examples and clear guidelines for the initial processes of job and position analysis, selection interviews, and reference checks. The final chapter on appraisal covers goals, objectives, performance standards, and performance planning. A useful chapter on legal aspects of personnel administration and evaluation summarizes important federal laws and EEOC regulations.

Fully half of this book consists of sample job descriptions, recruitment and interview forms, and performance evaluation forms. However, the examples are not clearly connected to the discussion in the text, e.g., the evaluation forms from Simmons and MIT seem to require an "essay" response from the evaluator, but the text indicates that this type of evaluation is difficult and not commonly used. Placing the examples in the context of the discussion would have improved their usefulness. With this caveat, this book is recommended for librarians who wish guidance in the process of performance appraisal. This book might also be useful as an auxiliary text in general management and personnel management courses.—*Ellen Crosby, University of South Carolina, Columbia.*

Scientific Journals: Improving Library Collections through Analysis of Publishing Trends. By Tony Stankus. Supplement no.6 to *The Serials Librarian*. New York: Haworth, 205p. $29.95 (ISBN 0-86656-905-7). LC 90-40988.

The answer to the question of how to balance serial collection needs with weak budgets continues to baffle librarians. This is especially true in the dynamic science-technology-medicine (STM) fields, where prices are high and getting higher. A book that addresses the topic of improving library collections through analysis of publishing trends is a good idea, but it must be timely and practical. Tony Stankus has made an effort to meet this need, but the observations and advice he puts forth in this book are not completely timely or practical.

Stankus arranges the essays around three themes: (1) watching the journal reading and publishing habits of faculty and other users, and adjusting decisions to cancel or subscribe based on their movements; (2) analyzing world publishing trends and determining how the most can be had per subscription dollar; and (3) technology and competition and the improvements they have brought to science journals.

The three essays devoted to the first theme are the most difficult from which to gain any insight. The point that seems to be made in each is that journals are to be selected with the scientifically elite in mind, ignoring attention to other selection criteria (e.g., does the journal lend support to a degree program or an area in which extensive research is being conducted? Is there index access to the articles?). In one essay Stankus follows the publishing careers of 470 students and concludes that journal collections must be maintained for them because they are "mental athletes" whose needs are "undoubtedly greater than those with more commonplace interests and skills." In the next essay he reports on the publishing output of scientists who have been appointed to editorial boards. He actually suggests that librarians can and will make subscription and cancellation decisions based on whether or not a member of the faculty is on the editorial board of a journal! In the summary it is suggested that more research must be done in this area to "help rationalize acquisitions in light of the career events and life changes of the clientele." The final, and most puzzling, of the theme 1 essays concentrates on academicians who are elected to the National Academy of Sciences. He asserts that once a scientist is elected to the academy and has published papers in its proceedings (*Proceedings of the National Academy of Sciences*), then the scientist will begin to sponsor other scientists for election and publication in the proceedings. The scientist then will turn to writing reviews, so it is up to the librarian to subscribe to the serials containing these reviews so that other aspiring scientists "seeking to collaborate with these senior scholars can gain quite an insight into the academicians and their fields through reviews."

The six essays devoted to the second theme are more useful. Stankus offers interesting observations on publishing trends in Asia and Canada. The result is information that can help many librarians determine whether or not they can save money and ensure quality by subscribing to a less expensive Asian or Canadian scientific journal.

The two essays that address the third theme are interesting and have some good historical facts, but they do not form a particularly useful corollary to the preceding essays.

The reader should be aware that four of the eleven essays in this book are reprinted articles that appeared in 1987 and 1988. Three of those four essays contain references to serials pricing issues as they affect STM collections. The facts and figures surrounding these issues have changed since then. Two of the essays have no substantiating references, and none of the remaining essays have references any more recent than 1988. The author also indulges in naive assumptions such as the assertion that librarians benefit from scientists because all libraries receive direct compensation from the grant money awarded to scientists.

This book talks to a very small audience of librarians who have the time and money to scrutinize and cater to the needs of a few elite users. The material presented could serve to stimulate discussion and action, but it offers little practical help to the vast majority of librarians grappling with high STM prices and weak budgets.—*Beverly Geer-Butler, Ohio State University.*

Technical Services in the Medium-sized Library: An Investigation of Current Practices. By Sheila S. Intner and Josephine Riss Fang, with a foreword by Robert D. Stueart. Hamden, Conn.: Library Professional Publications, 1991. 189p. $35 (ISBN 0-208-02173-6). LC 91-18311.

The authors have provided an overview of technical services operations by following the "stages through which materials pass in their progress through the library: acquisitions and collection management; cataloging and classification; document delivery; coordinated collection development . . . , and preservation management." The two chapters on preservation management and coordinated collection development stand out as excellent overviews of their respective topics. The chapter on preservation management is useful precisely because there is an "alarming lack of preservation awareness" among librarians, a point the authors noted in presenting the results of their survey of medium-sized libraries. The coordinated collection development chapter discusses issues that will gain importance as the amount of material that must be accessible to library patrons increases and library budgets shrink. Further, the approaches to planning advocated by the authors in this chapter are valuable in considering any cooperative library venture.

Overall, although there is much of value in this book, I was disappointed. The title indicates that the emphasis is on technical services in the medium-sized library. As the authors point out in their introduction, little attention has been paid to practice in medium-sized libraries despite the fact that these libraries account for a large segment of professional practice. In the preface, however, the authors have broadened the scope of the title: "This book describes current thinking about the organization and functioning of technical service departments in general and provides a brief look at technical service operations reported by a small group of medium-sized academic and public libraries in the United States." Less than 15 percent of the book explicitly addresses the authors' survey of medium-sized libraries. While much of the rest of the text is interesting and well written, there was no way to determine the appropriateness of ideas to medium-sized libraries. In some places, research libraries are obviously the focus. For example, the authors present the ideas of current or former administrators at Indiana University, the University of Wisconsin-Madison, and Yale University for a new paradigm for library organization. These are hardly medium-sized libraries. The paradigm "of holistic practitioners" presented is based, in part, on the assumption that the library has subject specialists on staff. Is this true of medium-sized libraries? The issue is not addressed. This work would be improved if the authors had presented the results of the survey separately in a research article. Mixing a general overview and the results of a specific study has diffused the focus and made this work somewhat confusing.

Editorially, there are some flaws. The text is inconsistent in its use of present and past tense. The entire chapter on "Computing in Technical Services" is written in the past tense—a curious phenomenon for a book subtitled: "An investigation of current practices." Most serious is the omission of the survey instrument from the appendix, although both the preface and the appendix title indicate its inclusion.—*Tschera Harkness Connell, Kent State University, Columbus Program, Columbus, Ohio.*

Technical Standards: An Introduction for Librarians. 2d ed. By Walt Crawford. Boston: Hall, 1991. 332p. $39.95 (ISBN 0-8161-1950-3); paper, $27.50 (ISBN 0-8161-1951-1). LC 91-7306.

As the world becomes more complex, the need for standards at every level grows, and more people need to understand individual standards and the standards-making process. This is the rationale for the second edition of Walt Crawford's *Technical Standards.* This edition, consisting of twelve chapter and an appendix, is divided into two parts. Part 1 is devoted to standards and standardization in general. Among the topics covered here in sufficient detail to be interesting (but not oppressive) are varieties of standards, implementations, levels and families, problems and dangers of standards, an explanation of the standards process, and a chapter discussing several standards organizations related to library and information work.

While part 1 is devoted to standards in general, part 2 focuses exclusively on standards for libraries, publishing, and information science, especially the history and present work of the National Information Standards Organization (NISO). Also contained in this part is helpful advice to the reader on how to become involved in technical standards work. The largest chapter in this section presents all current NISO standards, including those in draft stage. Each entry is accompanied by a summary of details, references to related standards, and useful notes and evaluative comments by the author.

The realm of standards making is relatively murky, involving numerous organizations, a variety of activities, and differences among types of standards (e.g., formal consensus, mandated, licensed, first agent, and demand agent standards). Crawford masterfully leads the reader through this maze of organizations, terms, processes, and meaningful distinctions. His book will be helpful to all librarians involved in any aspect of library automation or administration.

One shortcoming that detracts minimally from the book is that its index violates the formal consensus standard Z39.4-1984, Basic Criteria for Indexes, several times by listing more than ten undifferentiated entries under an entry term. This is ironic because Crawford explicitly draws attention to this facet of the standard in his discussion of it. If nothing else, this oversight draws attention to the need for this book: the interrelation and application of various standards in an information product are exceedingly complex. We all must understand them better in order to provide effective access to our collections and to improve our communication. Crawford's book admirably fulfills this need.—*Robert H. Burger, University of Illinois at Urbana-Champaign.*

Access Services: The Convergence of Reference and Technical Services. Ed. by Gillian M. McCombs. New York: Haworth Pr., 1991. 178p. $24.95 (ISBN 1-56024-170-5). LC 91-35637. Also published as *The Reference Librarian*, no.34, 1991.

Access services—traditionally defined as circulation, reserves, interlibrary loan, and stack maintenance—are not the subject of this volume. Rather, this work explores the growing need for libraries to emphasize access instead of ownership and hence combine technical and public services functions toward the common goal of improving access. Under the skillful editorship of Gillian M. McCombs, assistant director for Technical Services and Systems at the State University of New York, Albany, the fifteen articles build a shared vision of the future of librarianship with information access as its primary objective.

Access Services, simultaneously published as number 34 of *The Reference Librarian*, is a follow-up to the Fall/Winter 1983 issue (no. 9) of that journal, which had the theme "Reference Services and Technical Services: Interactions in Library Practice." The contrast is striking; the 1983 articles covered specific aspects of technical services that affected reference, whereas the 1991 articles emphasize ways in which reference and technical services staff may be combined to work toward the goal of access. One of the articles, which reports on a survey of how university library organizational structures have changed from 1985 to 1990, found only moderate change so far, but that nontraditional staffing alignments are becoming more commonplace.

The articles are organized into four sections: Public Services Perspective, Technical Services Perspective, The New Access Services, and National Library-Wide Concerns. At the end is a special report consisting of two articles that, although well written, seem out of place in this volume: one on determining key reference books and the other a clever discourse on publishing. The other authors, most of whom are from academic libraries, are fairly evenly dispersed between public and technical services and provide a balanced view of their topics no matter what their positions. The articles include discussions on how access versus ownership will change the roles of librarians, the causes and effects of reorganizing staff in various academic libraries, and methods of increasing access to users. Sheila Intner covers "Education for the Dual Role Responsibilities of an Access Services Librarian." Switching from editor to author, Gillian McCombs explains the equal role collection development librarians will share with reference and technical services librarians in the paradigm shift towards access. From his experience in national positions, Thomas Galvin describes how the American Library Association identified access as its highest priority, but also why ALA's organizational structure is unlikely to change soon to reflect the nontraditional restructuring beginning in some libraries.

This volume deserves a wide readership among both technical and public services librarians, and one hopes that it will not be overlooked by some due to its ambiguous title, *Access Services*, or its appearance as an issue of *The Reference Librarian*. As a technical services librarian, this reviewer was intrigued by the scenarios presented and felt that it broadened her perspective on the future of librarianship for both technical services and reference librarians, who someday might work together as access services librarians. Although primarily directed towards academic librarians, this book is highly recommended for any librarian interested in how reference and technical services roles may be combined.—*Lori L. Osmus, Iowa State University, Ames.*

Cataloging of Audiovisual Materials: A Manual Based on AACR2. By Nancy B. Olson. 3d ed. Ed. by Sheila S. Intner and Edward Swanson. DeKalb, Ill.: Minnesota Scholarly Pr., 1992. 335p. paper, $55 (ISBN 0-933474-48-2).

As readers familiar with its previous editions know, *Cataloging of Audiovisual Materials* is a comprehensive handbook for cataloging all types of media in accordance with the *Anglo-American Cataloguing Rules*, 2nd ed. (*AACR2*). Individual chapters explain, with numerous examples, the cataloging of cartographic materials, sound recordings, motion pictures and videorecordings, graphic materials, computer files, three-dimensional artifacts and realia, microforms, audiovisual serials, and kits.

The format of the book follows that of previous editions. The first two chapters cover general principles: reasons for cataloging audiovisual materials, decisions to be made before beginning such cataloging, and cataloging considerations such as levels of description, cataloging unpublished materials, choosing the dominant medium among several in a package, sources of information for the catalog record, selecting main and added entries, subject headings, classification, and use of "In" analytics. Individual chapters discuss the rules for specific media. All examples include subject headings (Sears and Library of Congress [LC]) and classification numbers (Dewey and LC).

Why purchase this new edition? It is based on the 1988 revision of *AACR2*. Of particular importance among the revised rules are those for cataloging computer files. There is a chapter on cartographic materials that was not in previous editions. As the editors state in the foreword, "The new edition also contains augmented treatments for audiovisual materials published serially and in multi-part kits and generally longer chapters with more examples and detailed commentaries" (p. vii). New to this edition are many examples of CD-ROM files, both monographic and serials, and of interactive media, both on videodisc and on CD-ROM.

If audiovisual materials are cataloged in your library, your cataloger will want this new, updated edition. If your library has audiovisual materials, but does not catalog them, this book provides you with the basic information you need to begin cataloging. Teachers of cataloging of audiovisual materials will want to include this book in their syllabi. Although not as specific as books devoted to the cataloging of one type of material, such as computer files, it offers more current cataloging information and more practical examples and explanations for the cataloging of audiovisual materials than other recent works that give more emphasis to other areas of nonbook management.

This book is particularly useful to those familiar with *AACR2* who might be new to media cataloging. The user can feel confident that records created based on this manual will be formulated according to the latest professional cataloging standards and will provide standardized bibliographic information to patrons who seek material in whatever format. —*Madeleine Johnson, California Polytechnic State University, San Luis Obispo.*

Conference on Acquisitions, Budgets, and Collections (April 10 and 11, 1991, Minneapolis, Minnesota) Proceedings. Theme: Acquisitions or Access? Comp. and ed. by David C. Genaway. Canfield, Ohio: Genaway & Associates, 1991. 357p. paper, $39.95 plus $3 shipping and handling (ISBN 0-943970-07-5). This second national conference is also known as Acquisitions '91.

It would appear that the 1990s belong to acquisitions. After years in the backwaters of librarianship, this specialization is receiving some of the limelight previously reserved for the likes of bibliographic instruction (the 1970s) and collection development (the 1980s). One need look no further than the rich field of conferences available throughout any recent year—Charleston, Feather River, University of Oklahoma, and now Genaway's second conference—to gauge the interest in acquisitions and the related fields of collection development and serial publishing.

Genaway has brought together a diverse group of librarians, mostly from reference, collection development, and acquisitions, and almost entirely from academic libraries. Their contributions cover the primary theme of access versus ownership and a number of topics farther afield, including preservation, database evaluation, budget management, and a perspective of British and U.S. academic librarianship. The twenty-eight contributed papers are, for the most part, good, even when they fail to address the topic at hand. Some of the papers represent the present, refreshing trend toward more empirical research. Ruffner's use study and subsequent commentary on access issues and Allman and Prejsnar's study of an online catalog are good examples. Other contributions are a more philosophical pondering of this debate over ownership. Strauch presents her usual challenging and entertaining perspective, whereas a more serious tone is adopted by Metz in his perspective from a liberal arts college. Only one segment of one paper in a discussion of "personing" the reference desk sent this reviewer running for cover. Could we all agree to return to sanity in the English language? "Personing" is *not* politically correct; it's simply silly.

The two plenary session speakers, Marilyn Gell Mason and Richard Dougherty, seem to have performed their by-now expected best. Dougherty, in particular, gets to the heart of the matter of access and ownership, the role of libraries, and the future of technology. Mason's maxim, "You can't borrow it from God, someone has to have it," is a succinct summary of the issues.

We have, then, the fallout of what was likely a lively conference. The topic was timely, the speakers seemed to be thoughtful and well prepared, and Minneapolis in the springtime is not the worst place in the world to meet. All of these things do not a good proceedings make, however. Many of the contributions could have been published in synopsis form without any significant loss of content or meaning. There is no indication that there was any kind of refereeing of papers or quality control, and this shows in the unevenness of some of the entries. The proceedings are produced from camera-ready copy, display several different type fonts and spacing, and therefore are visually disappointing. The price, $42 including shipping and handling, comes out to about $.12 per page, substantially higher than the photocopied format would seem to warrant, and this is particularly disappointing given the topic at hand. In the case of these proceedings, access wins out over ownership. Library science libraries might want to add it to their collections, but it is not recommended for general purchase. —*Karen A. Schmidt, University of Illinois at Urbana-Champaign.*

Disaster Planning and Recovery: A How-To-Do-It Manual for Librarians and Archivists. By Judith Fortson. How-To-Do-It Manuals for Libraries, no.21. New York: Neal-Schuman Pubs., 1992. 181p. paper, $39.95 (ISBN 1-55570-059-4). LC 91-44347.

This is a very useful handbook on disaster planning and recovery for libraries and archives. Fires, storms, floods, and earthquakes are the topic of the book, but the principles of planning and recovery also apply to small-scale leaks.

Fortson covers disaster planning, recovery, and risk management. She discusses the various types of disasters, their causes and effects, and ways to prepare for them in order to prevent or minimize the damage. Suggestions for preparation range from costly structural work to inexpensive precautions such as inspecting the plumbing and unplugging electrical equipment. She pays particular attention to fire detection and suppression systems and risk management.

The philosophy and process of writing a disaster plan are thoroughly covered, a model plan is provided that can be easily adapted for use by any library, and lists of suppliers and resource people are included.

The chapter on recovery addresses the general issues of ensuring human safety, assessing damage, moving the collections, and choosing methods of treatment. The options of replacing or restoring damaged materials are considered in relation to the expense and the effect on users. Specific procedures are given for restoring the common materials found in libraries and archives: books, paper, microforms, sound recordings, photographs, and magnetic media. Art and artifacts are not covered. Water damage receives the most attention, but heat, soot, smoke, and distortion are included too.

Fortson's approach is practical. This is not an exhaustive or theoretical work on library disasters, but rather a guidebook. It contains the most important information the average librarian or archivist needs in order to prepare for or deal with a disaster. The information is sufficiently complete to be useful, but not overwhelming. The advice applies to nearly all types and sizes of libraries and archives.

This attractive, well-written book is easy to read and to use. It is laid out nicely, with a clear typeface. Important points are highlighted in the wide margins, and illustrations are used to good effect. It includes a lengthy bibliography and a good index.

This is an excellent resource for disaster planning and recovery and is highly recommended for all libraries.—*Martha Hanscom, University of Wyoming, Laramie.*

The Future of Serials: Proceedings of the North American Serials Interest

Group, Inc., 5th Annual Conference, June 2–5, 1990, Brock University, St. Catharines, Ontario. Ed. by Patricia Ohl Rice and Jane A. Robillard. New York: Haworth Pr., 1991. 260p. $29.95 (ISBN 1-56024-081-4). LC 90-26651. Also published as *The Serials Librarian* 19, nos.3/4, 1991.

This collection of papers, presented at the fifth annual conference of the North American Serials Interest Group, Inc., and held at Brock University in St. Catharines, Ontario, presents an eclectic selection of perspectives on the current and future concerns of serials management. If the views of this group of authors are correct, the future of serials management, like its immediate past, will be a continuing struggle with the disparities between budgets and costs and between information resources and retrieval capacity. Although none of the articles in this volume breaks new ground, they do focus on current efforts in libraries to sweep back the sea, coping with the three principal problems of cost, control, and use, all of which were created, and possibly can only be solved, by other hands.

The ever-increasing prices attached to subscriptions combined with the near-universal decline in library acquisitions budgets guarantee that nearly every article in this volume touches, at least tangentially, on managing the cost of and planning for cancellations. Two articles, Marks and Nielsen's longitudinal study of serials at Utah State University and Milne and Tiffany's cost-per-use study at St. John's, Newfoundland, demonstrate two methods of assessing the price and potential value of titles.

The intertwined problems of control and access are reflected in several of the articles. The prospect that new computer and communications technologies will improve both bibliographic and physical access and the forms in which that access might come is examined in several articles. The discussions of peer review were particularly interesting; they reinforced an understanding of the limited impact that librarians can have on the process of scholarly publishing, which, in turn, has such an impact on our collection policies. A particularly optimistic look at the future of serials is available in the presentations on the future electronic journals, offered as a panacea that will permit us all to bypass the whole complicated and messy procedure of judgment in our acquisition process. That we as a profession are still attempting to avoid this problem is profoundly sad.

If the opinions represented in this volume are correct, the future of serials is a combination of more of the same and improved tools to manage them. The volume is well worth examining for the focus and the thought the participants bring to the problems that have taken library budgets to the edge.—*Nancy Schell Scott, Greenville, North Carolina.*

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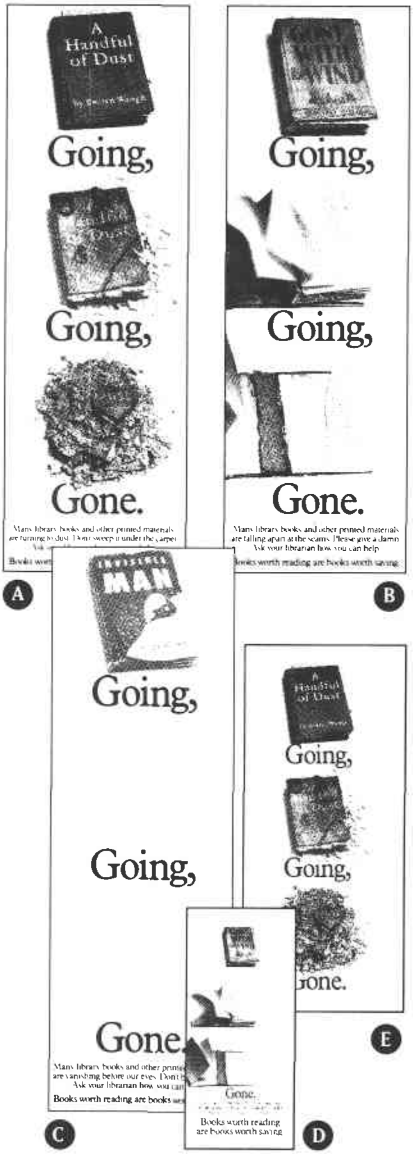
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E

Letters

From Hans H. Wellisch, Professor Emeritus, University of Maryland:

In reply to Prof. F. W. Lancaster's letter to the editor in *LRTS* 36, no.2, p. 252, I wish to point out that my critique of citations of foreign sources was not aimed at the use of these sources as such, but rather at the fact that at least two of them, one in Russian (Fridman and Popova) and one in Norwegian (Holst) were cited without title translation, which makes them inaccessible to most American readers as well as to Lancaster's students in Cairo (assuming they had the same list of references). In my two volumes of bibliographies of indexing and abstracting, I provided for every one of hundreds of foreign entries both title translations and abstracts, without which such references would remain inscrutable for the vast majority of monolingual users.

From Jane Treadwell, Director of Collections and Technical Services, Robert W. Woodruff Library, Emory University:

I noted with disappointment the omission of "The Serial Marketplace," an article I coauthored with Lee Ketcham in the June I, 1991, issue of *Library Journal*, from John Riemer's review of the year's work in serials. Apart from the natural tendency of any author to want some recognition for one's work, I am genuinely puzzled over this omission. The article reported on the results of the first (so far as I know) survey by librarians, publishers, and subscription agents of the opinions and practices of these three interrelated communities. The survey was sponsored by an ALCTS committee, the AAP/ALCTS Joint Committee, and ALCTS thought the survey results of enough significance to warrant a day-long program at the 1991 [ALA] Annual Conference ("Beyond Price: Serials Trends in the 90s"). I am curious as to why Mr. Riemer chose to exclude the article: did he think *Library Journal* too popular to include in his review? Did he disagree with some of our survey results or did he question our methodology? I have had second thoughts about some of our conclusions myself, but surely Mr. Riemer could have pointed out problems without dismissing the article entirely. I would have thought that some mention of our article would have appeared in Mr. Riemer's "General Works" section, since the article is truly general, covering a wide range of issues and all types of libraries. Although Mr. Riemer says the "broadest possible view of serials librarianship is attempted," it seems he must have rejected our article as being too broad in scope.

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Volume 36, 1992

Compiled by Edward Swanson

General Procedures Used in Compiling the Index

The following types of entries are included:

a. authors—of articles, reviews, and letters
b. titles—of articles and of articles about which letters were published
c. subjects—of articles and of books reviewed

Subject entries for individuals are identified by "*(about)*"; letters are identified by "*(c)*".

Reviews are indexed by name of reviewer and by subject of the work reviewed, identified by "*(r)*". They also are listed by title under the heading "Books reviewed."

Entries are arranged word by word following the "file-as-spelled" principle. Numbers are arranged before alphabetical characters; acronyms without internal punctuation are arranged as words.

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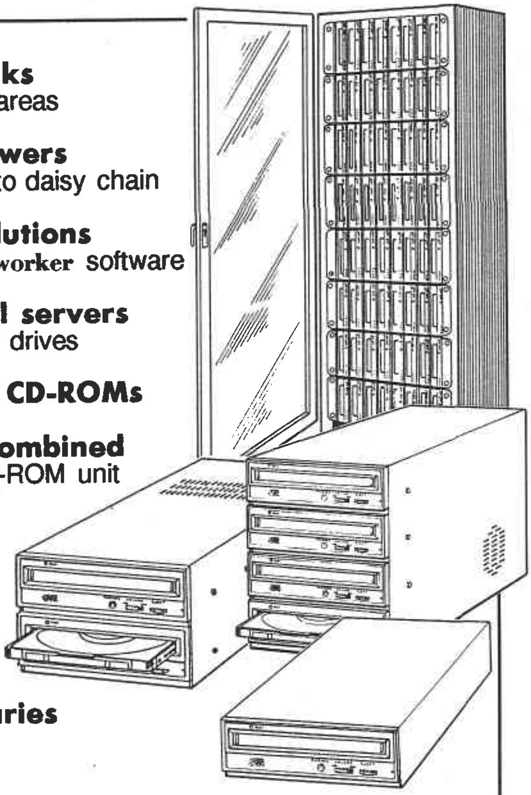

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